METAPHORS OF COMMAND AND CONTROL IN THE UNITED KINGDOM AND THE UNITED STATES OF AMERICA

Developing a Communicative Framework to Enhance Interoperability for Emergency Management Organisations

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DEDICATION

This study is dedicated to my friend Danny.

Though you are not here to see the end of my PhD, your friendship and memory is critical in helping me achieve my goals in life.

Gone but not forgotten.

ABSTRACT

This study explores Command and Control in the context of emergency management in the United Kingdom (UK) and the United States of America (US). Command and Control is regarded as both the dominant and traditional model of emergency management though debate continues as to its appropriateness in the face of disaster. Criticism is perhaps strongest within the academic community. Concerns include it being overly bureaucratic and centralised, inflexible and slow for decision-making, though for some it brings order to chaos and is thus essential. The model is embedded in legislation, policy and practice. The Police, Fire and Ambulance services, and others, are brought together within frameworks such as the UK Gold, Silver and Bronze (GSB) and US Incident Command System (ICS) to collectively respond when disaster strikes. However, *"interoperability"* problems, whereby organisations are seemingly unable to work together occur compromising response efficacy and the failings during Hurricane Katrina (2005) stand as testament to this. This thesis examines how emergency responders interpret Command and Control, and the implications of this for interoperability

This mixed methods interpretive study comprises 30 semi-structured interviews with key UK and US emergency management practitioners focusing on their views of Command and Control. Participating organisations include Police, Fire and Ambulance services, and Local and Central Government agencies. The research design embraces linguistic and visual metaphor to answer the Central Research Question *"how do U.K. and U.S. emergency management practitioners metaphorically interpret Command and Control?"*

The collated data were analysed using content analysis to identify general themes. Then, Morgan's (2007) 8 seminal organisational metaphors and Lakoff, Espenson and Schwartz's (1991) Master Metaphor List (MML) were employed to identify metaphors used to communicate understanding of Command and Control in both the linguistic and visual domains. The findings show that interpretations of Command and Control are varied, suggesting that key organisations at the heart of emergency management are not *"on the same page".* However, some commonality based around Morgan's *Brain*, *Culture* and *Machine* metaphors was noted.

Over 500 linguistic metaphor types were found providing an insight to the rich natural language of emergency management. The use of MML metaphors such as *Status is Position*; *Progress is Forward Motion* and general metaphors such as *Natural World* and *Cooking* were frequently noted meaning they are broadly understood within a multi-agency setting. Consequently, the use of such terms enhances interoperability as they can increase the likelihood of shared understanding. Thus, establishing a new theoretical domain and the basis for a metaphorical language of emergency management. Furthermore, 30 visual metaphors (diagrams) were collated that demonstrated some variability in perspective. However, a standardised interpretation, 27 of 30 or 90% of the sample-frame, based on the *Status is Position* metaphor

linked to a hierarchical top-down frame associated with the traditional model was noted. This indicated a heavily embedded view, which contrasted the more variable linguistic findings.

Building on these results, a suite of learning tools were constructed; the Command and Control Interoperability Tool Box or CCIT–Box. This contains 2 interoperability assessment tools, a Theory of Interoperability Metaphors (TIM), and 5 conceptual metaphors, namely Command and Control as a *Candle*, a *Trivial Pursuit Pie*, a *Golden Thread*, *Spinning Plates* and a *Virus and Antidote*. These tools have been validated through use in academic and professional settings. Their design opens up the *"mind's eye"* by harnessing the power of metaphor in an innovative and novel way using linguistic and visual methodology. The tools engage participant's in deeper and more critical review of their own and other's views of Command and Control, and indeed broader emergency management issues. This mechanism effectively bridges the known gap between academic theory and practice to enhance interoperability and knowledge to (ideally) reduce the loss of life and suffering in future disasters.

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1 Introduction

1.1 Introduction to the Study

The world can be a magical place, full of beauty and wonder: teeming with life. The oceans and coastlines across the globe offer some of the most beautiful scenery imaginable; likewise the mountains, foothills and canyons offer breath-taking views. However, the world also has a darker side, coastlines are often battered by storms and tsunamis, mountains may actually be volcanoes: indeed, the earth itself can be moved by seismic activity resulting in devastating earthquakes (Blaikie and Wisner 2004, Dinwiddie, Lamb and Reynolds 2011). Humankind lives with ever-present threats; events commonly termed disasters occur and are becoming more frequent and severe (Bissell 2013, Lewis, Phillip and Westgate 1976, Perry and Quarantelli 2005b, Quarantelli 1998, Wilson and Gosiewska 2014). These events can be naturally occurring, such as the flooding which afflicted many parts of the United Kingdom (UK) during the winter of 2015 to 2016 (McKie 2015), or the US Carolinas flooding of October 2015, which caused 25 deaths and $12 billion in damages (Federal Emergency Management Agency 2015c). Human induced events also occur, either accidently or deliberately. Paris, France suffered coordinated terror attacks on 13th November 2015 when 3 suicide bombers detonated devices at the Stade de France, followed by mass shootings in cafes, restaurants and at the Bataclan concert hall: 130 people were killed and a further 368 injured (Phillips and Rawlinson 2015). Events such as this highlight the need for emergency organisations, such as the Police, Fire and Ambulance services amongst others, to be prepared and to work together collaboratively when the worst happens (Kapucu 2008, Waugh and Streib 2006, Waugh 2009c).

1.1.1 An Introduction to Disaster Research

Disasters are constantly in the media spotlight; modern 24-hour global news coverage ensures that such events are transmitted almost instantaneously (Denef, Bayerl and Kaptein 2013, Hashim, Ishak and Ahmad 2015). The general public, if asked, are likely to be able to recall events that could be termed disasters. These may be localised such as flooding, a train crash or a terrorist attack. Or something bigger, for example an earthquake, hurricane or a tsunami: these events may be recent or even historic with the memories passed down over generations (McEwan and Jones 2012). Over time memories of these events can fade or become distorted and these stories pass into myth, fable and legend forming part of humanity's social fabric. Disasters litter our social history, the tales of Atlantis, Sodom and Gomorrah and Vesuvius are widely known, but only the latter is broadly accepted as confirmed fact (Neev and Emeery 1995, Zhirov 2001).

Human history is intertwined with disaster, but notwithstanding this disaster research is a relatively modern and small field, which has struggled to establish itself as an independent academic discipline (Tierney 2007). Stalwarts such as Enrico Quarantelli and Russell Dynes

are largely credited with driving and establishing the field in the 1960s at the revered Disaster Research Centre, formally of the Ohio State University and now located at the University of Delaware (University of Delaware 2014b). Though, earlier works such as Prince (1920), Sorokin (1942) and Form and Noslow (1958) contributed seminal works in the decades preceding. Thus, scholarly disaster research is less than 100 years old, although there have been dalliances in the 18th century writings of Voltaire and Rousseau (Dynes 2000a).

Disaster research is traditionally practically oriented characterised by inductive field studies and criticised for being somewhat theoretically limited so there is a need for *"blue sky"* innovation (Lindell 2011, Magsino 2009, Nowell and Steelman 2015, Perry and Quarantelli 2005b, Stallings 2006). Given the life-saving nature of disaster research it seems that the optimum (if indeed one exists) would be a blended approach that combines theoretical advancement and practical application. However, arguing that one approach fits all would be an attempt to limit and indeed restrict the field, as there is a place and value in both. Disaster research is the new kid on the block; key perspectives in the formative years were systems (Barton 1969, Dynes 1970) and natural hazards approaches (Burton, Kates and White 1978, White 1974) prior to the establishment of the modern field associated with the works of Quarantelli, Dynes and the later writings of White (Scanlon 1988). Further perspectives have been adapted, such as constructivism, social tension and cohesion, race, conflict and gender: although, it has taken time for these to be accepted (Barton 1969, Quarantelli and Dynes 1977, Spector and Kitsuse 1977, Tierney 2007): thus the field is somewhat of a late adopter in comparison to other academic disciplines.

There has been a significant growth in the number of universities in the United Kingdom (UK) and the United States of America (US) teaching disaster and emergency management, risk and resilience, natural hazards, homeland security and other related subjects (Neal 2014, Tierney 2007). Consequently, there are more opportunities to study disaster than ever before. So it is likely that the pace of research innovation will increase, and the time it takes for new ideas and perspectives to become accepted may decrease. Indeed, building on the point made by Neal (2014) (p 3) there is a small, but increasing, number of practitioners, such as Jane Ayre (2004), Jennifer Cole (2010), Richard McMaster (2006, 2012) and Jelle Groenendaal (2014, 2015, 2013), *"getting PhDs whilst in the field to assist with bridging the gap",* linking theory to practice and vice versa. These contributions are invaluable not just in their notable contributions to knowledge, but also in the validity practitioner/researchers add as they help establish the credibility of disaster research as an independent academic discipline, which it has struggled to do to a certain extent (Tierney 2007). Furthermore, these researchers can help other practitioners to more readily appreciate the value and contribution academia can make in informing policy to develop theoretically sound and thus more effective practice, which historically has not always been the case (Neal and Webb 2006, Neal 2014).

1.1.2 Practitioner, Researcher and Academic

At outset of this study the author was an emergency management practitioner and part-time researcher, and it was this *"real-world"* experience the sparked an interest in disaster research and Command and Control in particular. The author's passion for disaster management was sparked on September 11th 2001, a tragedy that occurred many miles from his home in Newcastle, England. The 9/11 attacks occurred in New York, Washington D.C. and Pennsylvania in a country to which he had no discernible links. However, the extensive media coverage and images of heroism coupled with a social closeness born from New York's iconic status as the most filmed city in the world inspired the author to want to help (Tierney, Bevc and Kuligowski 2006, Winn 2013). 9/11 proved a seminal moment, a positive from a negative if you will, that forged both a career path and a probable life-long obsession with disaster research. Following 9/11 the author enlisted in the Royal Naval Reserve (RNR) and volunteered with the local H.M. Coastguard (HMCG) Volunteer Life Bridge (VLB) beginning a journey that ultimately resulted in this study.

1.1.2.1 Joining the Ambulance Service

9/11 occurred during the author's 2nd year of undergraduate study and the military and search and rescue training complimented the academic studies by enhancing personal development and employability. The HMCG operational response experience included cliff and surf rescue, helicopter and life-boat operations, and support for other emergency services such as the Police, Fire and Ambulance services in a multi-agency Command and Control environment at a primarily *"boots on the ground"* level. This experience solidified a desire to pursue a career in emergency management. So upon completion of his BA (Hons) Business Administration degree the author joined the North East Ambulance Service (NEAS) as an Emergency Medical Systems Operator (EMSO) and began working in a tactical-level Emergency Operations Centre (EOC) taking *"999"* emergency calls, prioritising calls for dispatch, and providing first-aid advice to stabilise patients often under difficult circumstances. Following the 1-year probation, advanced training in communications, computer-aided dispatch and major incident protocols were completed. The role also included extensive liaison with other emergency services, National Health Service (NHS) organisations and both internal and external stakeholders. It was here where the author became familiar with the principles of Integrated Emergency Management (IEM) (H.M. Government 2012a), the NEAS Major Incident Medical Management and Support (MIMMS) plan and supporting major incident protocols as part of the Continuing Professional Development (CPD) process (Advanced Life Support Group 2011). As a uniformed paramilitary organisation Command and Control was very much part and parcel of day-to-day life within NEAS. Whether it was as a *"newbie"* EMSO taking an infant cardiac arrest call looking across to the Senior Dispatcher or Duty Controller for protocols advice or just a supportive nod, or being descended upon by other officers keen to help when taking the initial report of a major incident, a faith in the system to provide support was imbued from day one.

Similarly, when major incidents occurred the palpable sense of relief when the on-call senior officers arrived to take command was evident within the EOC.

This increased exposure to the multi-agency environment, Command and Control, and the coordination of emergency response across multiple organisations both day-to-day and during major incidents led to a heightened awareness of and interest in disaster research. There were notable differences in how things were done at NEAS and HMCG, for example radio-calling procedures. Though, drawn principally from the same national doctrine there were subtle difference in how this was applied within and across agencies, though at the time only some of the differences were noticeable to the author. These day-to-day and major incident experiences coupled with an increasing awareness of interoperability concerns prompted the author to seek out further study to understand these issues further.

1.1.2.2 Returning to Education

In late September 2005 the author enrolled on the MSc Disaster Management and Sustainable Development programme at Northumbria University, whilst also continuing to work with both NEAS and HMCG on a part-time basis. At the same time, Hurricane Katarina was ravaging the Gulf of Mexico in the US, devastating an area greater than the UK and killing 1,833 people (Fischer et al. 2006, Kapucu and Van Wart 2008). The subsequent failed emergency response, which was viscerally played out in the global media (Waugh 2006), provided a contextual backdrop and *"real world"* validation (if one was actually needed) for much of the Master's course. This developed an interest in systems of emergency response, Command and Control and disaster sociology in particular, which formed the basis of 2 module papers that sowed the seeds for this study, academically speaking. The first was a critique of the then NEAS MIMMS plan (Advanced Life Support Group 2011), which concluded that the plan had limited understanding of scale and a *"the bigger it gets throw more resources at it"* ethos meaning it was unsuitable for large-scale disasters (McAleavy 2005). The second paper (McAleavy 2006) was an analysis of Hurricane Katrina using combined perspectives of risk and hazard linked to Command and Control (McAleavy 2006). It posited that a contingency arrangement should be built within existing US Command and Control informed by Dynes' (1981) Emergent Human Resource Model (EHRM), which advocates a decentralised, collaborative approach based on the continuity of existing socio-cultural systems. These papers and preceding research theoretically sensitised the author, shaping his though processes, which combined with practitioner experience manifested over time leading to this doctoral study (Strauss and Corbin 1990).

1.1.2.3 H.M. Coastguard Search and Rescue

On completion of the MSc the author had the option to return to NEAS or to take-up fulltime employment with HMCG. He chose the latter and relocated to Aberdeen in the north of

Scotland, and began his career as a full-time HMCG Officer in May 2006. The role included training in communications, search and rescue coordination, maritime operations, and meteorology and counter pollution based out of Maritime Rescue Coordination Centre (MRCC), now Coastguard Operations Centre (COC) Aberdeen. Also, secondments with both the Royal Air Force (RAF) and Royal Navy (RN) Search and Rescue helicopter flights and aboard the HMCG counter pollution and salvage vessel the Anglian Prince were undertaken to broaden knowledge, along with various cross-training activities with lifeboat crews, cliff-rescue teams and other agencies. Significant operational experience was gained working alongside multi-agency partners, the commercial and leisure maritime communities as well as the local community. Valuable major incident experience was gained during the abandonment of the Ocean Guardian oil platform, which caught fire causing the evacuation of 37 oil-workers in 2007 (Malkin 2007). And, the loss of the Bourbon Dolphin that capsized in 2007 whilst conducting anchor-handling operations for the Transocean Rather with the loss of 8 lives including the ship's Master and his 14-year-old son, which added further experience (Couttie 2014a, Couttie 2014b).

1.1.2.4 Local Government Emergency Management

In mid-2008 the author left HMCG to join the County Durham and Darlington Civil Contingencies Unit (CCU), which at the time was part of the County Durham and Darlington Fire and Rescue service. Although, the CCU provided emergency management services for and on behalf of 7 District and a County Council, prior to local government unitarisation (Game 2010). After the formation of the new unitary Durham County Council in 2009 the CCU transferred from the Fire service into the new local government organisation. Initially, as an entry level Civil Contingencies Officer (CCO) the author was introduced to the day-to-day world of multi-agency emergency planning and management. This involved developing emergency plans, designing, participating in and a facilitating training, exercising and validation activities in a multi-agency context within the Local Resilience Forum (LRF). This brought together key responder organisations to plan for, respond to and recover from emergencies (H.M. Government 2004c). This involvement exposed the author to a wide array of inter and intra-organisational perspectives, opinions and politics generally, though not always, in the name of the greater good. The day-to-day preparedness work was also interspersed with a number of major incidents. Memorably, being deployed without a translator to manage an Emergency Rest Centre for 63 Chinese and Chinese/Canadian tourists that had been evacuated at 02:00 due to a hotel fire, and only 2 of which spoke passable English (Burton 2008). To build on this growing knowledge, the author enrolled at the former University of Glamorgan, now University of South Wales combining his studies with his full-time career, commencing this doctoral study in mid-2009.

As time passed, opportunities for advancement opened up and the author was promoted to Senior Civil Contingencies Officer (SCCO) in late 2009 then Assistant Civil Contingences

Manager (ACCM) soon after. This came with more leadership responsibilities both internally within the CCU and council, and externally within the LRF. Liaison with senior Police, Fire and Ambulance officers, elected officials and the community become a daily activity as was responding to emergencies and major incidents at the Tactical (Silver) level as well as the operational (bronze) level of the UK Gold Silver and Bronze (GSB) local Command and Control framework (Arbuthnot 2008, Groenendaal, Helsloot and Scholtens 2013, Hills 1994, Pearce and Fortune 1995). An important function of the role was often translating *"blue-light"* emergency services terminology, culture and practice into a format that local government non-specialists could understand. Also, during the most serious major incidents the author acted as a tactical or strategic advisor to the Chief Executive or Deputy Chief Executive, which again had an element of translation and cultural sensitivity to support the integrated emergency response.

The author took command of the CCU assuming the role of Civil Contingencies Manager (CCM) in late 2011 gaining invaluable senior leadership experience at a relatively young age, which was challenging on occasions. For example, being mistaken for the tea boy at a meeting as all the other attendees were a good 20-25 years senior, and other slightly ageist experiences. Or being berated for using overly *"academic"* language to highlight an emerging risk that was then dismissed as science fiction (solar weather), that subsequently appeared a few months later on the UK National Risk Register (NRR) (Cabinet Office 2015). However, the most invaluable experience was the increased exposure to multi-agency working within the GSB Command and Control framework at all levels. This included the Strategic (Gold) level during both exercises, and *"real-world"* major incidents such as the Stiller's COMAH chemical plant fire in 2010 (Northern Echo Online 2010) and sadly, working with partner-agencies on the search and recovery of a 8 year-old boy lost in the River Wear in 2012, and leading the community support initiative following the death (Daily Mail 2012).

The collective experience of Command and Control across HMCG, RNR, NEAS and CCU were important in shaping this study. They informed both the research philosophy (discussed later) and the author's current role as Senior Lecturer and Course Director – Disaster Management at Coventry University, where the blend of practical field experience and academic research shapes his teaching pedagogy. Please note, this narrative is not included as a *"hey look at how experienced I am"* as there are many practitioners and academics with more experience and indeed expertise. Rather, the discussion herein is critical to understanding the author's motivation and the conceptualisation of the study as it illustrates how the author has experienced Command and Control at multiple-levels across a broad range of scenarios. These include maritime and medical emergencies, hazardous materials (HAZMAT) and Chemical Biological Radiological Nuclear (CBRN) incidents, transport accidents and severe weather such as flooding and snow storms, amongst others. This experience, gained both in and out of uniform, required considerable training in what should ostensibly be the same thing,

multi-agency emergency response. However, it was not the same, there were similarities in principles, terminology and practice, and culture and sometimes language but it was not consistently the same. The author was required to unlearn or relearn in slightly different ways what had been taught and practiced elsewhere, sometimes even within the same organisation. In terms of interoperability, of organisations working together (Pollock 2015), this raised questions in respects of Command and Control due to the vital and central role this function plays within emergency management in both the UK and the US.

Consider the phrase *"take them down"*, which can conceivably be issued over a radio within the hierarchical chain of command (Adey and Anderson 2012). To a coastguard it can mean take a survivor down a cliff, to a police officer it can mean to subdue and arrest a suspect, to a judge in a court of law it means take the defendant from the dock to the cells, and to the military it can mean to neutralise as in kill a hostile. However, despite the use of the same language, English, its meaning can be contextually specific; it can actually be understood and have different meaning to different people and organisations. Emergency response is inherently multi-organisational; numerous agencies can be involved, and they may (or may not in an international disaster) speak the same language and use the same terminology, policies and procedures. However, simply talking the same language or using the same terminology does not guarantee communication as something more is required to ensure understanding (Garber 2008). Forcing dissimilar organisations to adopt standardised Command and Control *"is problematic because it ignores the great diversity among organizational cultures"* (Neal and Webb 2006) (p 274). These factors intrigued the author, having experienced Command and Control in different guises, in different uniforms and indeed wearing no uniform at all. And, also having undergone command training with each organisation, which was slightly different and gauged to the requirements of the particular role and organisation this led to a question, if practitioners were actually understanding Command and Control in a uniformed manner?

1.1.3 Comparative Studies of Emergency Management

This is a comparative study of emergency management in the UK and the US, specifically of the Command and Control frameworks used to respond to disaster. The comparative method was selected as it is somewhat underappreciated in the field but is becoming increasingly relevant as *"we lack understanding of disasters and emergency management institutions around the world"* (McEntire and Mathis 2007) (p 1). Furthermore, the significance of disaster is more clearly understood from an international and comparative perspective as it provides a broader and more comprehensive view on which to base future policy (Dynes 1988). McEntire (2010) (p 12) argued that there have been a limited number of studies that adopted a comparative perspective, meaning there is scope for further studies using this approach.

Dynes (1988), whilst providing a broader summary of disaster research cites the early comparative studies that followed the 1953 northern European floods that affected a number of

countries including parts of the Netherlands and the UK as important contributions. Similarly, Clifford's (1956) study of communities following a major flood of the Rio Grande river that affected Eagle Pass, Texas and Piedras, Mexico, which concluded that pre-disaster behaviour informed post disaster behaviour contravening earlier beliefs, and, McLuckie's (1970) dissertation on *"response to comparable stress situations in Italy, Japan and the United States*", cited in (Dynes 1988) (p 104), noted the link between increased centralisation of political and administrative decision-making in the emergency phase in Japan and Italy and delayed decision making have furthered our understanding of disaster through the use of comparative approaches. Other researchers have employed this approach, for example Mileti (1983) and Perry and Hirotada (1983) have contributed sociologically focused natural hazards studies. More recently Chang (2007) undertook a comparison of Taiwanese and US emergency medical systems (EMS) and Rake and Eivind (2009) conducted a study of incident commanders in Norway, Sweden and Bosnia-Herzegovina.

Comparative studies are growing in their importance, and will likely continue to do so. The UK and US are looked to for best practice as much of the research stems from North America, Europe and Australasia, and whilst this transfer of knowledge is positive in ensuring other countries are better prepared we have a duty to strive to understand our own emergency management in greater depth and to continuously improve (Drabek 2004, Dynes 2004, McEntire 2004). Furthermore, there are intrinsic risks with simply exporting emergency management expertise so comparative research is of the utmost importance to the preservation of life (McEntire 2010). Trainor and Velotti (2013) (p 38) argue, *"the broad and increasingly important range of topics in disaster management implies we need to dig further".* Accordingly, this study is focused on digging further into the minds of practitioners, through novel means, to learn more about a critical theme within practice.

1.1.4 A Study of Command and Control

Command and Control, defined as *"the exercise of authority and direction by the properly designated commander over assigned and attached forces in the accomplishment of the mission"* (Alberts and Hayes 2006) (p 32), is central to both UK and US emergency management. It is enshrined in legislation and policy in the form of the UK Civil Contingencies Act (CCA) 2004 (H.M. Government 2004b) and the US National Incident Management System (NIMS) (Department of Homeland Security 2008). It is used to enforce the law, fight fires and to treat the sick on a daily basis, as well as for multi-organisational coordination when disaster strikes so it can be described as being at the heart of emergency management. However, it "*is not a universally applicable organizational form"* (Trainor 2004) (p vii). It is inherently multi-agency encompassing a range of organisations, and often the wider community. Indeed, the breadth of social interaction often includes local, regional/state, national and international representatives depending on the scale of the disaster (Curnin et al. 2015). The exact make-up of a specific Command and Control framework is highly dynamic and is dependent on the

nature and scale of the particular incident being responded to (Curnin et al. 2015). The network of organisations that responded to the 7th July 2005 terrorist bombings in London (Herrera-Restrepo et al. In Pres, Kapucu, Yuldahsev and Arslan 2010, Stationary Office 2005) was different to that established during the severe flooding experienced across the UK in winter of 2015 to 2016 (Environment Agency 2016, Houghton et al. 2006). Similarly, the US response to Hurricane Sandy in 2012 (Federal Emergency Management Agency 2013a) was different to that following the San Bernardino, California shootings in 2015 (Bernstein 2015). This highlights the supposed flexible nature of existing Command and Control frameworks. Namely, the UK GSB structure (Hills 1994, Pearce and Fortune 1995), which is the local level of the national Command and Control framework outlined in the *"Responding to Emergencies: The UK Central Government Response Concept of Operations (CONOPS)"* document (H.M. Government 2013a). In the US, there is the Incident Command System (ICS), which forms part of the National Incident Management System (NIMS) (Department of Homeland Security 2008, Jensen and Thompson 2015). These frameworks are integral to emergency management, thus Command and Control is a prime research candidate due to its critical nature.

1.1.5 Research into Command and Control

The both the UK GSB and US ICS frameworks were developed in the 1970s; the UK version was developed by the Police service for civil unrest and the US system by the Fire service to more effectively deal with wildfire (Adey and Anderson 2012, Hills 1994, Jensen and Waugh 2014, Moynihan 2007). Research into the use of Command and Control actually predates the current frameworks, as these systems are manifestations of Command and Control methodology built on Weberian principals and the associated hierarchical autocratic management style drawn from military origins (Boersma et al. 2014, McEntire 2015, Tannenbaum and Schmidt 1973, Waugh 2009c). Revered classical disaster scholars such as Dynes, Kreps, Quarantelli and Wenger, have long criticised the use of Command and Control as being inappropriate for disaster response, citing an over-focus on situational awareness, centralisation, slow decision-making, hierarchies and bureaucracy as some of the key systemic failings (Dynes, Quarantelli and Kreps 1972, Dynes and Quarantelli 1975, Dynes, Quarantelli and Kreps 1981, Dynes 1983, Dynes 1994, Quarantelli 1988, Quarantelli 2002, Quarantelli 2006, Wenger, Quarantelli and Dynes 1990). Though, despite the limitations noted in academia, Dynes (1994) (p 142) states it is the dominant model and McEntire (2015) (p 112) the traditional model of emergency management, as the approach has become firmly embedded as the framework of choice in practice.

Perspectives on Command and Control differ (Trainor 2004), Cole (2000) enthuses *"few innovations in recent years have had more impact on the emergency services than the introduction and widespread adoption of the Incident Command System (ICS) for managing emergencies of all types".* Though, more contemporary research suggests that the implementation of NIMS, of which ICS is a part, is varied and the actual potential for

standardisation, which is often considered the panacea of policy goals is limited (Jensen 2010b, Jensen 2011, Jensen and Youngs 2015). Indeed, numerous authors positively cite Command and Control (Bigley and Roberts 2001, Buck, Trainor and Aguirre 2006, Jensen and Thompson 2015, Moynihan 2009): whilst, Comfort (2007), Dynes (1981, 1994), O'Leary and Blomgren-Bingham (2009) and Waugh (2009c) argue for more a collaborative approaches. Practitioners generally view the approach favourably (Groenendaal, Helsloot and Scholtens 2013, Moynihan 2009, Trainor 2004, Trainor 2004) though, Neal (2014), Groenendaal, Helsloot and Scholtens (2013) and Leonard and Howitt (2010) point out that there are few studies underpinning practitioner assertions that Command and Control is effective in the face of disaster. Furthermore, NIMS, the capstone of US federal emergency management policy, is not informed by rigorous academic research, which illustrates a significant gap in both knowledge and knowledge-transfer, which needs to be addressed as a matter of urgency (CDRSS 2006, Neal and Webb 2006, Neal 2014).

Development of Command and Control practice is continuing around the developed world, countries such as China and Japan given their extensive disaster experience are focusing on systemic development; whereas western countries are building flexibility within their respective frameworks (Boersma et al. 2014). In addition to the growing body of journal literature there are also an increasing number of doctoral studies. These include Jensen's (2010b) study of NIMS implementation behaviour, Chang's (2015) analysis of the Incident Command System (ICS), and Alteneiji's (2015) comparative study of Command and Control in the UK, US and Australia to develop United Arab Emirates (UAE) emergency management. These notable contributions are part of an increasing cohort of international researchers focused on Command and Control: a dedicated interest group within what is already a highly specialist and relatively small academic community (Tierney 2007).

1.1.5.1 Interoperability

Interoperability is seemingly vital to Command and Control, much like the notion of standardisation it is often viewed in aspirational terms. The more interoperable the better the response, though this has sometimes proven ineffective when faced with disaster. Indeed, UK emergency services struggled during the fuel crisis and floods of 2000 and the foot and mouth crisis of 2001, which contributed in part to significant legislative change (O'Brien and Read 2005, Pollock 2013). The UK Joint Emergency Services Interoperability Programme, colloquially known as JESIP, defined interoperability as *"the extent to which organisations can work together coherently as a matter of routine"* (H.M. Government 2013h) (p 2). The idea of interoperability is a noble one, though it is perhaps idealistic in the context of a truly catastrophic event as the notion that organisations can effectively share accurate information and maintain accurate communications is likely unrealistic (Bissell 2013, Quarantelli 2002, Quarantelli 2006). Furthermore, it is often reduced to a technological issue concerned with radios, talk-groups and repeaters when in fact it is so much more (Cole 2010).

The JESIP framework does encompass a broader remit including doctrine and organisation, operational communications, shared situational awareness, and training and exercising, and the work stream has produced the *"Joint Doctrine: the Interoperability Framework"* which has been adopted by the Police, Fire and Ambulances services in the UK (H.M. Government 2013h, Pollock 2013). However, disasters affect a much wider range of stakeholders so the Joint Doctrine is but a drop in the ocean when it comes to disasters that affect the whole of the community (Kapucu 2015). Whilst, JESIP and the Joint Doctrine are a welcome addition further work is needed. Accordingly, this study was designed to complement and indeed build upon JESIP with a comparative international perspective, and though located within the communications domain the research pushes interoperability beyond the technology perspective addressing Cole's (2010) concerns. That said, the notion that interoperability and central coordination are required has been rejected (Helsloot 2008a, Scholtens 2008), and the underlying assumptions of the Command and Control model have been questioned (Groenendaal, Helsloot and Scholtens 2013, McAleavy 2010), necessitating this and further research.

1.1.6 The Parameters of the Study

Given the dominance of Command and Control in practice (Dynes 1994), this study focused on engendering a deeper and more critical understanding of Command and Control by developing an innovative and novel communicative framework to enhance interoperability for emergency management organisations. The need to work together may seem obvious in the face of a disaster, though it has been questioned (Helsloot 2008a). Indeed, failures to do so, and many other problems, were viscerally demonstrated by the US response to Hurricane Katrina in 2005 (Holguin-Veras et al. 2007, Kapucu 2006, Waugh 2006), and the international response to the Haitian earthquake in 2010 (Coles, Zhuang and Yates 2012, Steinman et al. 2012). Thus, it is necessary to develop a more critical and in-depth understanding of Command and Control beyond a policy or definitional perspective because it is so central to practice. To achieve this, the study engaged senior UK and US practitioners drawn from key organisations at all levels of the UK and US Command and Control frameworks. Participants included the UK Civil Contingencies Secretariat (CCS) and Resilience and Emergencies Division (RED), and the US Federal Emergency Management Agency (FEMA), and a State Emergency Management Agency along with key local emergency managers from the Police, Fire, Ambulance services, and Local Government. Please note: individual participant and in some cases organisation names and roles were withheld to ensure anonymity (Bryman and Bell 2011).

Through the innovative application of metaphor in both the linguistic and visual domain this study developed learning tools to enable academia to be infused into practice in a novel but meaningful way to more effectively link theory and practice (Banks and Zeitlyn 2015, Ortony 1998). Metaphors are *"ways of talking and thinking about one domain in terms of another, and*

constitute one of the primary ways of framing and understanding the world of organizations", and they have significant communicative power (Cornelissen and Kafouros 2008b) (p 987). They provided a mechanism to filter research into practice so that in the future key policies such as NIMS/ICS and GSB can be more grounded in scholarly research, and thus more effective in future disasters. This study harnessed novel methodology to unlock the mind's eye, using the power of metaphor to advance knowledge of Command and Control based on the interpretations of key international practitioners to develop much needed learning tools.

1.2 Aim & Objectives

1.2.1 Aim

The aim of this study was to: *"Identify linguistic and visual metaphorical interpretations of Command and Control held by British and American emergency management practitioners in order to enhance multi-agency interoperability"*

1.2.2 Objectives

This study contained 6 key Objectives:

1. *Develop a comprehensive literature review focused on Command and Control within U.K. and U.S. emergency management*
2. *Assess the relevance of Morgan's* (2007) *organisational metaphors to U.K. and U.S. emergency management*
3. *Produce linguistic and visual data that encapsulates emergency management practitioner's views on Command and Control*
4. *Identify linguistic and visual metaphors of Command and Control used by UK and US emergency management practitioners*
5. *Compare and contrast the findings inter and intra country to identify patterns and trends*
6. *Develop a suite of learning tools to enhance critical understanding of Command and Control*

1.3 Overview of the Study

Chapter 2 reviews the literature placing the study in the historic context of disaster, disaster research and scholarship. It investigates emergency management and Command and Control's links to broader society, and the relevant specialist literature to address Objective 1. Chapter 3 outlines the philosophical location of the interpretative research strategy, detailing the primarily inductive mixed methods approach used within the field-study. Chapter 4 reviews the linguistic and visual findings and, chapter 5 discusses the significance of the said findings, which collectively address Objectives 2, 3, 4, 5 & 6. Chapter 6 reflects on the research drawing out and reviewing the contributions to knowledge posited, makes recommendations and presents opportunities for future research. The study then closes with the author's personal reflections on the research process.

2 Disaster, Disaster Research and Emergency Management

2.1 Purpose of the Literature Review

The purpose of this chapter is to provide rationale and validation for the study, and to locate it within the broader discipline and practice, both in national and international contexts specific to emergency management in the United Kingdom (UK) and the United States of America (US) (Hamilton and Clare 2004, Webster and Watson 2002). A thematic framework has been constructed that follows the direction set by the Aim of the study, noted below, which supports the development of a coherent literature review and the achievement of Objective 1:

The Aim of the study is to: *"Identify linguistic and visual metaphorical interpretations of Command and Control held by British and American emergency management practitioners in order to enhance multi-agency interoperability"*

This chapter reviews literature and theory that are relevant to the scope and Aim of the study, principally the metaphorical interpretation of Command and Control by emergency management practitioners. It explores the role of theory and theorising within the field of emergency management. The Theoretical Framework is summarised at the close of the chapter, and informs the Central Research Question (CRQ) and Supporting Research Questions (SRQ). The themes covered address the Aim and research questions focusing on interpretations of Command and Control in both the linguistic and visual domain through language and metaphor.

2.1.1 Scope of the Chapter

Defining the scope of the literature review is a critical step, too broad and focus may be lost but too narrow and it may not be possible to fully contextualise the problem within the discipline (Randolph 2009). Cooper's *"Taxonomy of Literature Reviews"* (1988) proposes 4 coverage strategies that assist the researcher with defining the scoping process as outlined below:

1. **Exhaustive Review:** To locate and consider every piece of research on a certain topic.
2. **Exhaustive Review with Selective Citation:** The population of the exhaustive review is bounded so the number of articles to review is manageable.
3. **Representative Sample:** To consider a representative sample of articles and make inferences about the entire population of articles from the sample.
4. **Purposive Sample:** Examine only the pivotal articles in the field.

This review adopted a *"purposive"* strategy enabling the author to clearly define the research problem and develop the CRQ by positioning the study within its discipline and broader

theoretical domains whilst also demonstrating command of the relevant literature (Cooper 1988). Randolph (2009) cautions with such an approach it is key to convince the reader the selected literature is central or pivotal to the field, and just as important that those not chosen are not central or pivotal. The *"purposive"* strategy was the starting point only. Key literature was reviewed, reference lists were interrogated to determine which of those were deemed relevant, these were found, the reference lists were examined, and the process was repeated until a point of saturation was reached, and no new literature came to light; thus ensuring appropriate coverage of the relevant materials (Randolph 2009).

Literature was accessed in numerous ways. The libraries at Coventry, Durham, Northumbria and South Wales Universities were the primary gateways to literature (Fu 1996). Specialist emergency and disaster management libraries within the School of Energy, Construction and Environment at Coventry University, the world-renowned E.L. Quarantelli Resource Collection at the University of Delaware's Disaster Research Center (University of Delaware 2014a), the Institute of Hazard Risk and Resilience at Durham University (Durham University 2014), the Disaster and Development Centre at Northumbria University (Northumbria University 2014a), and the Library and Information Centre at the Emergency Planning College (Emergency Planning College N.D.), also provided gateways to specialist literature (Fu 1996). The *"Coventry Locate", "Google"* and *"Google-Scholar"* search engines coupled with the *"Scopus"* and *"Science Direct"* bibliographic databases were used as primary electronic gateways into the broader academic literature.

A combination of these sources, supported by appropriate key-words, outlined in Fig 2.1, ensured the identification and collation of relevant literature was effective in meeting the objective of situating this study within the broader literature and validated the need for this work (Hamilton and Clare 2004, McCabe and Timmins 2005, Randolph 2009, Rocco and Plakhotnik 2009, Steward 2004).

2.1.2 Literature Review Keyword Lexicon

Fig 2-1: Literature Review Keyword Lexicon	
1.	Emergency Management
2.	Disaster Management
3.	Civil Contingencies
4.	Command, Control and Coordination
5.	Emergency Response
6.	Interoperability
7.	Terminology
8.	Gold, Silver and Bronze Commands
9.	National Incident Management System

10.	Incident Command System
11.	Multi-Agency Coordination
12.	Metaphor – Linguistic, Organisations and Visual

Appropriate key words are the foundation of an effective search but the selection process is complex, time consuming and needs considerable thought (McCabe and Timmins 2005). Consequently, the keyword lexicon was continuously monitored and revised to ensure its appropriateness throughout this study (Bell 2010).

2.1.3 Literature Introduction

Literature was gathered from many sources encompassing academic journals, books and practitioner materials. Journal articles were critical as they are subjected to rigorous peer-review to assure quality; this is pertinent in the developing field of emergency management where new concepts of thinking are much needed (Neal 2014, Quarantelli 1993, St Petersburg College 2015). Historically disaster journals do not achieve high impact-factors as they are highly specialist and readership is often smaller than in other main-stream subjects. Consequently, the literature is fragmented across multiple thematic journals as academics try to secure the highest possible impact-factor. Disaster may be the central focus of an article or a secondary domain: for example, Professor Duncan Shaw of Warwick University who is known for his work in Operational Research (OR) where much of his work uses disasters as a foil to develop OR theory and can be found in relevant OR journals such as the European Journal of Operational Research (Greece, Shaw and Hayashi 2013, Greece, Shaw and Hayashi 2015). As a result disaster literature is found not only in emergency and disaster journals, but also, in business, management, politics, medical and health, OR, public administration, natural hazards, urban planning and sociology journals etc. Fig 2.2 provides an overview of the key-journals cited, though please note, it does not list all journal citations rather, in keeping with the *"purposive"* strategy it lists the key journals for indicative purposes.

Fig 2-2: Key Journals Cited

Title	**Theme**
1. Disasters	Disasters and Emergencies
2. Disaster Prevention and Management	Disasters and Emergencies
3. Journal of Business Continuity and Emergency Management	Disasters and Emergencies
4. Journal of Contingencies and Crisis Management	Disasters and Emergencies
5. Journal of Emergency Management	Disasters and Emergencies
6. Journal of Homeland Security and Emergency Management	Disasters and Emergencies

7.	International Journal of Mass Emergencies and Disasters	Disasters and Emergencies
8.	Resilience	Disasters and Emergencies
9.	The Australian Journal of Emergency Management	Disasters and Emergencies
10.	Journal of Hazardous Materials	Hazards
11.	Natural Hazards	Hazards
12.	Natural Hazards Review	Hazards
13.	International Review of Public Administration	Public Administration
14.	Journal of Public Administration Research and Theory	Public Administration
15.	Journal of Public Management and Social Policy	Public Administration
16.	Academy of Management	Business and Management
17.	Journal of World Business	Business and Management
18.	Journal of Management Studies	Business and Management
19.	Technological Forecasting and Social Change	Innovation and Forecasting (Social Sciences)
20.	Academic Emergency Medicine	Medical and Health
21.	International Emergency Nursing	Medical and Health
22.	Pre-hospital and Disaster Medicine	Medical and Health
23.	Resuscitations	Medical and Health
24.	Politics	Politics
25.	Political Geography	Politics

2.1.4 Synopsis and Logic of the Chapter

This chapter critically evaluates perspectives of *"what is a disaster?"* to locate this study within an extensive and diverse body of literature while also clarifying key terminology (Alexander 2005, Quarantelli 1998). Relevant literature is used to demonstrate that disaster is a vague and misunderstood term, which seemingly means different things to different people and organisations. For example, Bridgend County Council inter-changeably cites disaster, major incident and emergency as one in the same suggesting a lack of understanding within the field (Bridgend County Borough Council 2013). At first the consequences of this may not seem obvious; however, the literature demonstrates the critical impact of this vagueness. Discussion of a range of societally familiar physical disaster-scales focused on natural hazards providing a lead into the lesser-known social disaster-scales, which demonstrate everyday emergencies, disasters and catastrophes are qualitatively different. However, as will be seen, these social

scales are not widely known beyond a small sub-section of academics despite having the potential to radically alter views and practices.

The origins of disaster within mythology, religion and society are explored to establish the geological and social timelessness of disaster and demonstrate the concept's significance to humanity. This is in contrast to the comparative infancy of disaster research, the emergence and evolution of which is evaluated to reveal the almost oxymoronic position in which humanity has been afflicted by disaster since human existence began but have seemingly only been studying them academically for less than 100 years and planning for them in co-ordinated ways less so (Scanlon 1988, Steward 2004). The chapter then focuses on a critical evaluation of the origins, development and entrenchment of Command and Control within civil and military contexts to demonstrate a seemingly historic societal comfort with being told what to do by others, primarily because some people simply *"don't know any better"* (Spolsky 2006). Command and Control's application within emergency management is relatively new, and the favour it carries is seemingly fervent and has largely ignored academic criticism of its effectiveness (CDRSS 2006, Jensen and Waugh 2014, McEntire 2015, Neal and Philips 1995, Quarantelli 2002, Schneider 1992, Waugh 2009c). Relevant legislation, policy, guidance and practice are contrasted to academic literature, and critiqued to viscerally demonstrate limitations of Command and Control. These rise from a *"one-size fits all"* philosophy built on a limited conceptualisation of scale, whereby the bigger the scale the more resources are required. As the scale increases the resource requirements become untenable, supplies become less likely and more unsustainable impeding Command and Control (Bissell 2013, McAleavy 2010).

A critical review of relevant management and organisations theory follows, and situates the study within the culture, identity and metaphor domains to develop a broad-based theoretical critique of Command and Control. The summation of the Theoretical Framework is a systematic locating of this study within historic, practical and theoretical contexts to demonstrate the limitations of Command and Control (Dynes, Quarantelli and Kreps 1972, Quarantelli 2002). The origins and evolution of UK and US emergency management closes the chapter. This critical evaluation demonstrates the centrality of Command and Control to practice and the relative newness of both the underpinning research base, legislative and policy structures and the actual Command and Control frameworks, which are firmly entrenched in law and policy despite significant known limitations within the academic community (Department of Homeland Security 2008, H.M. Government 2004c).

2.2 What is Disaster?

The early 21st century has been a testing time for practitioners, as the world has become an increasingly turbulent and disastrous place (Bissell 2013). Phrases such as emergency,

disaster and catastrophe permeate the global media on an increasingly frequent basis, with these words being used inter-changeably (Kapucu 2006, Kapucu and Van Wart 2006). The events of 9/11 (2001) are arguably of a significantly smaller physical and geographic scale than either the Indian Ocean tsunami (2004) or the Sichuan earthquake (2008), however, these are all cited as both disaster and catastrophe, as there is no universally accepted definition of such terms (Quarantelli 1998, Shaluf, Ahmadun and Said 2003). Beyond an emotive similarity, is disaster the same as catastrophe; are they both emergencies or are they something different? It may be argued that current understanding is perhaps interpretive as these terms mean different things to different people; leading to questions of *"what is disaster?"* and *"what actually is it that practitioners are planning for?"* (Blaikie 2004a, Livesey 2012).

2.2.1 Defining Disaster

It is important to consider the different perspectives on disaster, beginning with initial scope and context leading into discussion of formal definitions adopted by the United Nations (UN), the World Health Organisation (WHO) and the European Union (EU) as these are arguably 3 of the most influential organisations within the international emergency management arena. The focus will then concentrate on academic perspectives, and then UK and US emergency management as the principal countries of focus in order to illustrate the divergence of views, and clarify the perspective adopted within this particular study. The UK and the US share a special relationship, and as will be discussed there are similarities and differences in their respective approaches in terms of their legislation; policy and practice that are not currently being fully explored presenting unique and innovative research opportunities (Kapucu 2010, McEntire 2008, Woolner 2011).

The author is not seeking to develop a universal definition; indeed this is beyond the scope of this study. Quarantelli (1998) (p225) states *"to be concerned by what is meant by the term disaster is not to engage in some useless or pointless academic exercise":* this resonates closely with the emergency management ethos of saving lives, thus studies such as this should seek a balance between theoretical and practical contributions (Lindell 2011). The discussion and critique herein is to locate this study within the relevant literature and clarify the meaning of key phrases and terminology as they relate to this study. The following discussion is designed to promote a critical mind-set: questioning the effectiveness of existing UK and US Command and Control frameworks. Please note: this study adopts Quarantelli's (2006) perspective that every day *"emergencies", "disasters"* and *"catastrophes"* are different social entities (see Fig 2.4). For convenience, within this study the term disaster will be used without quotation marks to refer generically to such events. However, to ensure clarity the author will cite the levels of Quarantelli's typology in quotation marks to signify that these terms and meanings are being used at any given point.

2.2.2 What is Disaster?

The word disaster is drawn from the Latin word *astrum* meaning star; as ancients believed earthquakes and volcanoes etc were mandated by the heavens leading over time to the view of disaster as an *"Act of God"* (Schenk 2007, Zibulewsky 2001). Society is thus considered a victim; helpless to prevent disaster, as it is perceived as being God's will (Loimer and Guanieri 1996). This traditional religious interpretation has largely been rejected as the field has moved towards physical and social sciences perspectives (Steinberg 2006, Wijkman 1984).

The UN's International Strategy for Disaster Reduction (UNISDR) defines disaster as *"a serious disruption of the functioning of a community or society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources"* (United Nations 2007). The World Health Organisation (WHO) adopts a less clear position, citing 3 separate interpretations, which is perhaps indicative of an organisational acceptance that disaster is not a homogenous concept. The 1st is the aforementioned ISDR definition (World Health Organisation 2014). The 2nd is the Centre for Research on the Epidemiology of Disasters (CRED), definition as a *"situation or event, which overwhelms local capacity, necessitating requests for national or international level external assistance"* (Centre for Research on the Epidemiology of Disasters 2009). The 3rd views disaster as *"a term describing an event that can be defined spatially and geographically, but that demands observation to produce evidence. It implies the interaction of an external stressor with a human community and it carries the implicit concept of non-manageability"* (World Health Organisation 2014). Conversely, the European Union (EU) Civil Protection Mechanism does not define disaster; instead States can decide when they want to make an appeal for support and for what situations (House of Lords 2009). This implies there is no consensus across these 3 key-international organisations. There are similarities related to the overwhelming of local coping capacity, a central trait in these perspectives (Kreps 1984, Wachtendorf, Brown and Holguin-Veras 2013). However, this lack of consensus suggests current understanding has a considerable subjective element to it.

The question *"what is disaster?"* was a key theme within field in the late 1990s - early 2000s (Perry and Quarantelli 2005b, Quarantelli 1998). The driving principle was an emphasis on the exchange of ideas to gauge consensus about what disasters are, and also differentiating the use of definitions as a basis for government action (Perry and Quarantelli 2005a). Much of the debate appears to be influenced by the media as a communicative power and influence on the modern world (Scanlon 2005). Numerous definitions have been adopted around the world. These share common themes and are useful working definitions that suit their particular needs (Emergency Management Australia 1998, International Federation of the Red Cross and Red Crescent Societies 2012). However, wider discussion is beyond the scope of this study so focus will instead concentrate on academic, UK and US perspectives.

Disaster can be defined in a multitude of ways; either natural or man-made (Disasterium 2013). Tansel (1995) cites earthquake, tornado, hurricane, hailstorm, blizzard, avalanche, landslide, meteorite, drought, flood, epidemic, fire and energy interruption as types of natural disasters, and riot, nuclear accident, hazardous material spill, terrorism, sabotage, product tampering and war as types of man-made disaster. Interestingly, Tansel (1995) considers flood, fire, energy interruption as potentially both natural and man-made disasters, which highlights the limitations of this approach. Arguably, this reflects the blurring lines between natural and man-made disasters.

A range of perspectives are brought together within the seminal book *"What is Disaster? Perspectives on the Question"* (Quarantelli 1998). Gilbert (1998) outlines 3 disaster paradigms: patterns of war, social vulnerability and uncertainty and, Kreps (1998) defines disaster as systematic event and social catalyst. Dombrowsky (1998) refers to disaster as a collapse of cultural protections, and Porfiriev (1998) highlights the subtle differences in the meaning of disaster, which vary substantially in dictionaries of foreign languages. This dialogue amongst esteemed disaster scholars illustrates the diverse perspectives that abound. Each perspective was met with a formal response to promote further dialogue, and the intense scholarly debate spawned a follow-up book called *"What is Disaster?: New Answers to Old Questions"* (Alexander 2005).

This 2nd volume added further perspectives: Alexander (2005) views disaster in terms of changes in culture, society and international relations that such events can evoke. Jigyasu (2005) ponders whether disaster is a reality or a construct, whereas Britton (2005) rather eloquently defines disaster as either a dog or demon citing an old Chinese tale about an Emperor who one day asked his court artist, *"What is easy to paint and what is difficult to paint?".* After thought the courtier replied, *"Dogs are difficult, but demons are easy"* explaining that obvious things are harder to get right because everyone knows about them and hence everyone thinks they know what the essence of a dog is. In contrast, no one has actually seen a demon therefore drawing one is easy because who can say it is incorrect. This tale eloquently illustrates the subjective and contextual nature of defining disaster: is it a dog as when one happens it is obvious, or is it a demon because no one really knows what it is (Britton 2005)? If no one really knows what a disaster is than how can we develop effective Command and Control frameworks and training programmes?

Other perspectives include disasters as collective stress defined by Barton (2005) (p126) *"as situations in which many members of a social system fail to receive expected conditions of life from the system":* or as a *"crisis gone wrong"* which imbues an abstract sense of scale to differentiate between the 2 terms (Boin 2005). Stalling (2005) builds upon this more inclusive concept of crisis and collective stress by adding an emphasis on mass deprivation into the

definitional scope. Smith (2005) on the other hand conceptualises disaster as *"a system made sense of in the eyes of the beholder"* a view which is arguably grounded in the interpretivist paradigm (Blaikie 2004a, Livesey 2012). Considerable discord remains within the literature relating to issues such as *"the extent to which disasters are caused by outside agents or those internal to social systems and whether disasters are characterised by altruism and conflict"* (Wachtendorf, Brown and Holguin-Veras 2013) (p4). Many authors concede the non-routine element of disaster but argue disasters occur periodically due to the structure of contemporary social systems; for example, the risk perspective adopted by Perrow (1999, 2011) and Boin's (2005) crisis perspective; though there is general consensus that disasters are qualitatively different from every day emergencies (Bissell 2013, Quarantelli 2006, Wachtendorf, Brown and Holguin-Veras 2013).

The field has shifted focus from simply defining disaster to related issues such as the concept of resilience and *"the capacity of affected communities to recover with little or no external assistance*" (Manyena 2006) (p433). This shift has placed a stronger emphasis on risk reduction and humanitarian work that has placed resilience, rather than disaster, at the nucleus of the debate (International Federation of the Red Cross and Red Crescent Societies 2014, Manyena 2006). Stalling (2005) (p273) argues *"it is not necessary to have universal agreement on either the terms to be used in our analyses or their precise definition"* so perhaps the search for a universal definition of disaster is currently regarded as a useless and pointless academic exercise which may explain why academics have generally moved on (Alexander 2005).

Quarantelli (1982) (p453) stated *"we all have habitual ways of looking at disaster phenomena"* supporting the earlier view that disaster may be a subjective and interpretative concept as its meaning differs from person to person. Furthermore, analysis of various definitions found that most were mere programmatic declarations, as those who define actually declare what they intend to do with the social process called disaster rather than profess a universal conceptualisation (Dombrowsky 1998, Lewis, Phillip and Westgate 1976). If organisations and individuals interpret disaster to suit their own purpose through programmatic declarations rather than developing a consensus; this questions the collective ability of multiple organisations to effectively prepare for, respond to and recover from disaster, i.e. what they plan for, may well be very different.

- **Key Point 1: The concept of disaster is viewed differently meaning organisations and individuals may not necessarily be referring to the same thing**

The US Federal Emergency Management Agency (FEMA) is part of the Department of Homeland Security (DHS), and its mission is to *"support our citizens and first responders to ensure that as a nation we work together to build, sustain, and improve our capability to prepare for, protect against, respond to, recover from, and mitigate all hazards"* (Federal Emergency

Management Agency 2014a). This statement does not contain any reference to disaster but espouses an *"all hazards"* perspective, which underpins all federal preparedness, response and recovery activities and could arguably be viewed as a generic *"we're ready for everything"* ethos.

The purpose of the US Emergency Management Institute (EMI) is to improve the competency of US government officials at all levels in protecting, responding and mitigating all types of disaster. Their mission refers to the concept of disaster, which is central to the training doctrine. FEMA does not cite a definition nor make a programmatic declaration (Westgate and O'Keefe 2008, World Health Organisation 2014). Rather, 70 definitions appear within their training literature, and the FEMA on-line glossary defines disaster as *"an occurrence of a natural catastrophe, technological accident, or human-caused event that has resulted in severe property damage, deaths, and/or multiple injuries"* (Blanchard 2006, Federal Emergency Management Agency 2014c). Furthermore, neither the National Incident Management System (NIMS) nor the Incident Command System (ICS) policy documents define disaster within their respective glossaries despite the centrality of the concept to these key doctrines, which questions the validity of the underlying principles of the approach (Department of Homeland Security 2008, Federal Emergency Management Agency 2008b).

- **Key Point 2: The US seems to have a fragmented conceptualisation that acknowledges multiple perspectives on disaster**

In comparison the UK adopts a programmatic declaration though interestingly disaster is not defined within its key policy framework. The Civil Protection Lexicon, the central repository for UK emergency management terminology, cites disaster but directs the reader to a definition of *"emergency"* which is a programmatic declaration created as a trigger for activation of the emergency management mechanisms within the Civil Contingencies Act (2004) (H.M. Government 2004b, Westgate and O'Keefe 2008). This Lexicon defines an *"emergency"* as *"an event or situation which threatens serious damage to human welfare in a place in the UK, the environment of a place in the UK, or the security of the UK or of a place in the UK"* (Civil Contingencies Secretariat 2013). An additional note is provided which states *"to constitute an emergency this event or situation must require the implementation of special arrangements by one or more Category One Responder"* which also illustrates the programmatic nature of this trigger definition (Civil Contingencies Secretariat 2013).

The concept of disaster is integral to UK emergency management, indeed the key pre-2004 guidance document is entitled *"Dealing with Disaster"*, though despite citing disaster in the title it does not define the term (Cabinet Office 2004). It is worth noting, that disasters are primarily considered negative events, consequently, it can be speculated there may be an unwritten aversion to the use of the term within UK emergency management due to the negative

connotations it can sometimes infer. At the time of writing, and despite significant research, no official policy or guidance to support this perspective could be located. However, substantial anecdotal evidence drawn from the author's professional experience and informal discussions with numerous practitioners, within and outside this study, supports this view.

Collectively, this suggests the UK perspective on disaster is narrow with all disaster-like events being framed as *"emergencies"*. Whilst arguably effective in ensuring the trigger-mechanism can be activated to confront a wide-range of scenarios and a logical and defensible policy it either deliberately or inadvertently categorises all events in the same vein. For example, under the CCA's (2004) definition the Somerset Levels floods (2014), the Buncefield oil refinery explosion (2005), and the 7th July 2005 London bombings were *"emergencies"* and approached in the same way. This broad-brush approach results in an erroneous perspective that disaster and emergency are the same relegating the term to mere semantic, emotive and vague utterance (Bridgend County Borough Council 2013, Shaluf, Ahmadun and Said 2003). The current UK concept of *"emergency"* has limited scale consideration. Levels of emergency exist but are focused on increasing centralisation inadvertently perpetuating a belief that the worse it gets the more direction will be provided by Central Government, via a Command and Control framework that is designed to scale-up as the situation worsens, which requires increasingly more and likely scarce human and material resources (Civil Contingencies Secretariat 2013, H.M. Government 2013a, McAleavy 2010). Academic literature advocates the criticality of scale indicating this broad-brush approach is too generic, as scale must be considered in any analysis (Bissell 2013, McAleavy 2010, Quarantelli 2006, Wachtendorf, Brown and Holguin-Veras 2013).

- **Key Point 3: The UK's emergency definition is too narrow and perpetuates a myth that all disasters are the same**

2.2.3 Some Disasters are Bigger than Others: Incident Scale Theory

Most people agree some disasters are bigger than others (Wright 2007). In comparison to other fields social science research into disasters is in its infancy. This research considered the ways *"disasters"* differ from *"emergencies"*. It was conclusively documented that *"disasters"* were qualitatively and quantitatively different from routine *"emergencies"*, though these findings do not seem to be as well reflected within practice (Bissell 2013, Bridgend County Borough Council 2013, Quarantelli 2006, Wachtendorf, Brown and Holguin-Veras 2013). However, this is beginning to change primarily as a result of the failings of Hurricane Katrina, which inspired a small-cohort of researchers to conceptualise events of a catastrophic nature in a different way (Bissell 2013, Lagadec 2007, Quarantelli 2006). The importance of a disaster's scale is now recognised within the academic literature, and incident-scales can be categorised into 2 distinct streams of physical and social scales.

2.2.4 Physical Disaster Scales

Physical scales are arguably more recognised in the broader societal sense, as the public gain awareness through the media, which often cites the relevant physical scale when reporting on the disaster (British Broadcasting Corporation 2010, Guardian Online 2012, Scanlon 2005). However, sometimes the media may communicate inaccurate or false information due to a lack of specialist knowledge, which can often hinder emergency operations (Tierney, Bevc and Kuligowski 2006). Fig 2.3 gives examples of physical disaster scales.

Fig 2-3: Examples of Physical Disaster Scales

Physical Disaster Scale:	**Explanation:**
Air Quality Index (AQI)	Classifies levels of air pollution and provides recommended actions and health advice (Department for Food and Rural Affairs 2013)
Beaufort Wind (BWS) scale	Is an empirical measure for describing wind intensity based on observed sea conditions (Meteorology Office 2013)
The International Nuclear and Radiological Event Scale (INES)	Is a tool for promptly and consistently communicating to the public the safety significance of events associated with sources of ionizing radiation (International Atomic Energy Agency 2014)
Enhanced Fujita Tornado scale (EFTS)	Uses damage caused by a tornado and relates the damage to the fastest 1/4-mile wind at the height of a damaged structure (National Oceanic and Atmospheric Administration 2011).
Modified Mercali Intensity scale (MMIS)	Composed of increasing levels of intensity that range from imperceptible shaking to catastrophic destruction, is designated by Roman numerals to categorise earthquake intensity (United States Geological Survey 2014a).
Richter Scale (RS)	A mathematical device used to compare the size of an earthquake; intensity is expressed in whole numbers and decimal fractions and it is commonly used by the media when covering earthquake disasters (British Broadcasting Corporation 2010, United States Geological Survey 2014b).
Safir-Simpson Scale	Widely used by the media specifically in coverage of hurricanes (British Broadcasting Corporation 2012a, Weather Channel 2014). The scale is a *"1 to 5 rating based on a hurricane's sustained wind speed used to*

	estimate potential property damage" (National Oceanic and Atmospheric Administration 2014).

Though Fig 2.3 is not an exhaustive list of physical scales, these examples illustrate a range of mechanisms that can categorise and delineate differences between one event and another, albeit in a single physical hazard context. Physical disaster scales are more recognised within the field: however, their use in emergency management can be somewhat limited as most emerged from the study of natural hazards and are not principally designed for emergency management.

2.2.5 Social Disaster Scales

Faulkner (2001) working in tourism disaster management developed a typology that differentiates between crises and disasters in a social context. Crises are seen as internal and induced by the actions or inactions of the organisation; whereas, disasters are seen to be induced by natural phenomena or external human action. Although, useful as a starting point in differentiating between one event and another, this typology is limited as the features of both crises and disaster in some cases are markedly similar, meaning an event can be both, which limits the usefulness of the approach.

The Rohn Emergency Scale (2007) is a complex mathematical approach that can be tailored to a specific geographic context such as a city, county or continent. Emergencies are defined in 3 dimensions of scope, topographical change and speed of change with the intersection of these providing a detailed scale for defining an emergency in order to monitor, and forecast the probability and nature of a potentially developing event (Gomez et al. 2007, Gomez et al. 2007, Plotnick et al. 2007, Rohn and Blackmore 2009). This is a useful addition to the field as it can be used for preventative and recovery measures; whereas, other scales are *"descriptive rather than quantitative, which makes them subjective and ambiguous"* (Ronin N.D.).

Fischer (2003) developed a 10 point-scale outlined in Fig 2.4 which also applies scale, scope and duration criteria within a geographic context, and provides a simple means to differentiate between disasters. Fischer's work is useful as it enables the systematic identification of research that adopts the *"all-hazards"* approach, a perspective that advocates commonalities among all types of technological and natural disasters so the same management strategies can be applied to any disaster or emergency to encourage effective and consistent response strategies regardless of the cause (Lovekamp 2009, Nagel 2014). According to Lovekamp (2009) (p 96) the scale is "*a beneficial tool for practitioners and government officials in their mitigation, preparation, and response efforts much in the same way the Richter scale provides a construct for envisioning the severity of an earthquake's impact"*.

Fig 2-4: Fischer's Disaster Scale Categories (2003)	
Level of Incident	**Scale, Scope & Duration**
Dc-1: Everyday Emergency (Ee)	Minor in Scale, Scope, Duration
	Minor in Scope, Major in Scale & Duration
	Partial in Scope, Minor in Scale & Duration
Dc-2: Severe Emergency (Se)	Major in Scope, Minor in Scale & Duration
	Major in Scale & Duration, Minor in Scope
Dc-3: Partial Small Town (Pst)	Major Scale & Duration, Partial Scope – Town
Dc-4: Massive Small Town (Mst)	Major Scale, Scope, Duration – Town
Dc-5: Partial Small City (Psc)	Major Scale, Duration, Partial Scope - Small City
Dc-6: Massive Small City (Msc)	Major Scale, Scope, Duration – Small City
Dc-7: Partial Large City (Plc)	Major Scale, Duration, Partial Scope - Large City
Dc-8: Massive Large City (Mlc)	Major Scale, Scope, Duration – Large City
Dc-9: Catastrophe (C)	Major Scale, Scope, Duration – Several Populated Areas
Dc-10: Annihilation (A)	Major Scale, Scope, Duration – Society Disaster

Arguably the most applicable social disaster scale in terms of its usefulness to the practice because of its relative simplicity and communicative ability is Quarantelli's (2006) *"emergencies"*, *"disasters"* and *"catastrophes"* typology developed following the 2005 Hurricane Katrina as outlined in Fig 2.5. The strength of Quarantelli's typology is that it clearly articulates social differences emanating from the consequences of any given disaster, rather than a specific hazard. The defining criteria of both *"disasters"* and *"catastrophes"* are clear and easily applied (similar in style to the INES), and it has potential to enhance practice (Lauta 2015). For example, it questions the UK policy of extending Central Government control as an *"emergency"* grows; the typology indicates this is likely to be ineffectual when the incident expands from a *"disaster"* to a *"catastrophe"* leading to failure (McAleavy 2010, Quarantelli 2006).

Fig 2-5: Quarantelli's Disaster Typology (2006)	
Level	**Differentiating Social Factors**
Everyday Emergency	Dealt with by the emergency services and authorities
Disaster	1. Organisations have to deal with far more and unfamiliar entities
	2. Loss of autonomy and freedom of action as crisis needs take over
	3. Different performance standards apply
	4. Much closer private and public sector interface occurs
Catastrophe	1. Most or all the community is heavily impacted
	2. Local officials are unable to undertake their usual roles
	3. Help from nearby communities cannot be provided as they are also heavily impacted
	4. Most, it not all of the everyday community functions are sharply and concurrently interrupted
	5. The media socially constructs catastrophes more than disasters as a strategic overview is impossible
	6. The political arena becomes more important, in disasters you tend to get local political involvement with national political support, but in catastrophes the most senior politicians become heavily involved
	7. Mass and extended out-migration of people (Wachtendorf T. et al 2013)

The importance of Quarantelli's typology is growing, which is why it is adopted within this study. A 7th catastrophe characteristic, namely Mass and Extended Out-Migration was added demonstrating its growing influence (Wachtendorf, Brown and Holguin-Veras 2013). Also, Bissell (2013) (p 5) notes Quarantelli's typology when defining catastrophe as *"an event that directly or indirectly affects an entire country, requires national or international response, and threaten the welfare of a substantial number of people for an extended period of time"*. Bissell's definition is a synonym of Lagadec's (2006) (p 3) hyper-complexity, whereby *"our modes of acting are configured according to "normal" benchmarks of complexity, meaning that typical emergent events can be neatly classified within a relatively defined and stable and defined context".* Based on analysis of Hurricane Katrina the premise of hyper-complexity is that the scope (and complexity) was so significant that it comprehensively overwhelmed existing planning, preparedness and response methodologies, which were either ineffective or counterproductive meaning that new ways of thinking and conceptualising emergency management are required (Bissell 2013, Lagadec 2007). Bissell (2013) (p 6) also defined a

Continuum of Magnitude to aid with the conceptualisation and differentiation of scale, summarised in Fig 2.6 below:

Fig 2-6: Bissell's Continuum of Magnitude (2013)	
Level	**Definition**
Emergency	An event, usually sudden, that puts at risk the life or well-being of at least one person. Local emergency response resources are adequate to meet the immediate needs of those who are affected by the incident. The response is directed/coordinated by personnel from within the same jurisdiction as the responding agencies
Disaster	An emergency involving multiple people, of such a magnitude that local resources are not adequate to meet the immediate needs of those who are affected by the event, requiring that additional resources be brought in from outside jurisdictions. The response is directed/coordinated by personnel from within the jurisdiction where the event occurred, but many of the responders may be from other jurisdictions, increasing the challenge of response coordination
Catastrophe	Use of one or a combination of the definitions offered above. The response is from so many different jurisdictions, levels of government, and different kinds of organisations and the needs of the affected population are so diverse and spread out, that no single entity can coordinate it all. Many needs go unmet, at least in the short term
Extinction Level Event	An event so severe that humans may not survive. No useful organised interventions can be anticipated

James Lee Witt, Director of FEMA (1993-2001), stated in Bissell (2013) (p VII) *"this is the book I wish had existed when I directed the Federal Emergency Management Agency"* indicating that research on catastrophe is growing in its practical relevance. However, beyond this there is little evidence within the practitioner literature to suggest that *"disaster"* and *"catastrophe"* are viewed differently beyond a vague and emotive notion (Bissell 2013, Bridgend County Borough Council 2013, Civil Contingencies Secretariat 2013). Academia, on the other hand, contains numerous perspectives that illustrate quantifiable differences in scale (Fischer 2003, Gomez et al. 2007, Plotnick et al. 2007, Quarantelli 2006, Rohn and Blackmore 2009). This suggests the UK's catch all *"emergency"* definition, whilst a useful trigger mechanism is out of kilter with research findings. Conversely, it may be speculated that the US with its multiple definitions of disaster may actually have a broader perspective.

Collectively, these issues question the validity of current practice as organisations and individuals are structuring their preparedness, response and recovery activities based on differing interpretations of disaster. This suggests the foundations of practice are established on a theoretically unreliable basis. Academics generally agree that disasters are qualitatively different from everyday emergencies; however, this view is not readily adopted within the practitioner literature (Bissell 2013, Quarantelli 2006, Wachtendorf, Brown and Holguin-Veras 2013).

- **Key Point 4: Some disasters are bigger and qualitatively different to others**

2.2.6 The Origins of Disaster & Disaster Research

The occurrences of *"emergencies"*, *"disasters"*, *"catastrophes"*, acts of nature or even acts of God, are almost certainly not a contemporary phenomenon. These events have been occurring since the dawn of time and undoubtedly prior to humankind's arrival on the planet so have nothing to do with human agency (Association of Space Explorers 2008, Crabtree 2007).

Today, in an anthropocentric conception of nature, humankind nominally sits atop the apex of the planetary hierarchy, dominating all other Earthly species: however, this was not always the case. Some 65 million years ago an asteroid, arguably a remnant of the initial Big Bang, struck the Earth (Alvarez 1980, Association of Space Explorers 2008, Benton 1996, Ramadurai et al. 1995, Schweickart and Kovacs 2008). The resultant global devastation wiped out 70% of all life on Earth driving the dinosaurs to extinction and enabling humankind to evolve and seize planetary dominance (Hildebrand et al. 1991, Kring 2000, Schweickart and Kovacs 2008).

Whether the dinosaurs died out suddenly as the result of a meteorite strike, or over a more prolonged time period due to volcanism induced atmospheric and climate change (Glen 1990, Glen 1996), it may be argued that the ascendant human role was only achieved by virtue of a *"catastrophic"* event, one that significantly altered the planetary natural order, shifting the course of the planet's evolution. This view posits the creation and evolution of the planet was, and will continue to be, influenced by disaster.

- **Key Point 5: Disaster is part of life on Earth that pre-dates human existence**

2.3 Disaster, Mythology, Religion and Society

2.3.1 The Influence of Disaster on Society

Manifestly, disaster is no more a contemporary phenomenon than the sun or the moon in that they have existed since time began. However, human recollections, or rather written accounts of such events, are relatively modern in comparison to the geological context. Arguably, the

earliest known written account of disaster is contained within Plato's *Timeaus* and *Critias* dialogues; the mighty island civilisation known as Atlantis was destroyed when *"a violent earthquake shook the land, giant waves rolled over the shores, and the island sank into the sea, never to be seen again"* (Castleden 1998, Joseph 2004, Zhirov 2001). This ancient tsunami supposedly occurred some 9,000 years before Plato's dialogues were actually written and intense debate over the existence, location and demise of Atlantis has raged ever since (Friedrich 2000, Spence 2003). Such is the power of this story that it still captivates audiences today (Panov 2001) with the tale having transcended myth and fringe-science crossing into popular culture (Eidos Interactive 2007, McDermott 2008, Peyton 2012, Turilli 2012, Wright and Cooper 2004).

The bulk of Western history has been pre-television so that, for the most part, experience of disaster has to have come from stories (Dynes 1998). Consequently, there is a high probability these tales would have been passed down through the generations by word of mouth, prior to being set down in written text (Thompson 2000). This could explain why stories that may once have started out as fact have transcended history, entering the annals of mythology and religion. There are consistent disaster narratives across and within different civilisations throughout time. For example, belief in a Great Flood exists within Western, Middle and Far Eastern cultures. Tales of a great deluge are ingrained within the histories of the ancient Abrahamic, Babylonian and Sumerian civilisations, and classical Greek antiquity, and also within medieval and contemporary Australian, African, American, Asian and European cultures, and have since become central themes within religions around the world (Bremmer 2008, Pleins 2010). Christianity, Islam and Judaism all detail historic and predicted disasters (Dynes 1998). For example, the Bible, the Quran and the Torah all reference arguably the most famous of all disaster legends, the story of Noah and a Great Flood that purged the Earth; most agree a Great Flood actually happened, though there is considerable debate as to whether it was a global or local event (Genesis 7, Neusner 2004, Shamoun 2009).

The imagery of ancient disasters still imparts considerable influence over modern cultural norms and values. Noah sent out a raven to inspect the Earth but it never returned so the bird has a reputation for being devious and untrustworthy; later he sent out a dove which returned with an olive branch, indicating that the waters had receded, which is used today as a symbol of hope and peace (Dynes 1998). Indeed, all post-World War One Olympic ceremonies have witnessed the release of doves as a symbol of a more peaceful world (International Olympic Committee 2013).

Disasters are seemingly not only part and parcel of physical life on Earth but also critical factors influencing societal development by shaping modern cultural norms and values. For example, the nursery rhyme *"Ring a Ring o Roses"* popular amongst children around the world, first appeared in print in Greenaway's (1881) *"Mother Goose"* and is commonly believed to be a

veiled reference to the Black Death (Opie and Opie 1951, Varsadi 1989). There is much debate as to the origins of the rhyme. Many believe it originated from the Black Death pandemic in 1348, which killed approximately 25 million people world-wide (Lavelle 2008), some think it stems from the Great Plague of London in 1665, which killed an estimated 100,000 people (Yadav 2009). In contrast others dispute it even refers to a plague at all (Mikkelson and Mikkelson 1995). These examples illustrate that disaster can be both a social as well as physical construct. It may be further argued that disaster and written accounts of these events are historical phenomena, a perspective evidenced herein. However, despite a seemingly physical and social familiarity with disaster; academic research, that is the rigorous scholarly pursuit of knowledge pertaining to these events, is conceivably a modern discipline (Lindell 2011, Scanlon 1988, Scanlon 1988, Tinkler 2011).

- **Key Point 6: Disaster is both a physical and social entity that has shaped life on Earth**

2.3.2 The Emergence of Disaster Research

Dynes (2000a) contends that *"Rousseau provided the first social scientific insights into disaster with his observation that the impacts of the 1755 Lisbon earthquake would have been diminished if the city had been less densely populated and if people had evacuated promptly in response to the initial tremors"* (Lindell 2011) (p 1). However, it is the little known Canadian scholar Samuel Henry Prince who is acclaimed as the father of disaster research (Dynes 1988, Scanlon 1988). The Reverend Prince was a chaplain aboard one of two ships sent from Halifax, Nova Scotia, Canada to recover bodies from the sinking of the Titanic in 1912 (Nova Scotia Communities, Culture & Heritage 2012). In addition, in 1917, he narrowly missed injury after the initial blast of the great Halifax Explosion, which occurred when a French munitions ship, the SS Mount Blanc, collided with the Norwegian vessel, SS Imo, and exploded in Halifax Harbour in Canada (Scanlon 1996, Younce 2011). The blast demolished one third of Halifax and Dartmouth cities respectively, killing 1,963 people and injuring approximately 9,000 more, affecting 22% of the total population (Scanlon 1988). Prince attended casualties, organised relief services and subsequently took charge of relief effort, which went on for months; as such, he experienced first-hand 2 of Canada's most internationally famous disasters (Scanlon 1988).

In May 1919, just 16 months after the Halifax explosion, Prince enrolled on the PhD programme at Columbia University, New York focusing on the effects of the 1917 Halifax Explosion; his thesis and subsequent book *"Catastrophe and Social Change"* is considered as the first systematic study of disaster and its relief (Bergman 2008, Drabek and Evans 2007, Prince 1920, Scanlon 1988). Though, his thesis of man as a savage post-disaster has largely been disproved, his work is regarded as the classic study of disaster and was considered ahead of its time (Scanlon 1988).

Disaster research as a scholarly discipline stagnated following Prince's seminal work as little additional progress in the field was made until the 1950s and commencement of research by the National Opinion Research Center and National Academy of Sciences studies (Lindell 2011). Summaries of these studies were published by Marks (1954), Fritz (1961) and Barker and Chapman (1962), then systematically analysed by Barton (1969) cited in Lindell (2011). Britton (1999) argues that 12 seminal works track the progress of disaster research, a synopsis of these works is provided in Fig 2.7:

Fig 2-7: Summary of Seminal Work in Disaster Research

Title	Author/Year	Synopsis
1. Catastrophe and Social Change	Prince H. (1920)	This Seminal work was the first social study of post-disaster behaviour. It posits temporary short-term changes in social-structure following the 1917 Halifax Harbour explosion: *"man as a savage"*
2. Man and Society in Calamity	Sorokin P. (1942)	Sorokin's work focuses on the effects war, famine, pestilence and revolution have on mental processes and how they can alter culture, behaviour and social organisation.
3. Community in Disaster	Form W. and Nosow S. (1958)	This was the first study to focus on organisational disaster response, presenting a systematic analysis of the effects of a tornado on a specific community
4. Man and Society in Disaster	Baker G and Chapman D. and (1962)	This was the first edited disaster text containing contributions from 17 authors, primarily drawn from sociology, though the work of Barton, Thompson and Hawkes added to a developing body of literature concerned with organisations and disaster
5. Communities in Disaster: A Sociological Analysis of Collective Stress	Barton A. (1969)	Barton uses sociology to understand the social processes of disaster through developing the idea of *"collective stress"* as a focal point in codifying early disaster research. He presents key models such as the emergency social system, mass

		convergence and the therapeutic community, which are still used today
6. Organized Behavior in Disaster	Dynes R. (1970)	Dynes links organisation studies with a disaster context fully opening up this relatively unexplored theoretical domain to disaster scholars
7. Man Made Disasters	Turner B. (1978)	Turner focuses on disasters as failures of foresight. His *"man-made disaster"* model, based on a study of 84 accidents, sought to explain why warning signs went unnoticed as in principle if they are recognised failures can be avoided
8. Disasters: Theory and Research	Quarantelli E. (1978)*	Offers a series of short empirical-based sociological articles focused on a range of disaster phenomena
9. Sociology of Disaster: Contributions of Sociology to Disaster Research	Dynes R., De Marchi B. and Pelanda C (1987)	Dynes, De Marchi and Pelanda argue that disaster research is an integral part of mainstream sociology rather than an isolated and esoteric field
10. Social Structure and Disaster	Kreps G. (1989)	This synthesis of 29 presentations from a 1986 symposium is focused on understanding social structure and disaster. Kreps posits a key structural code containing 4 elements: domains, tasks, human and material resources and activities
11. What is Disaster?: Perspectives on the Question	Quarantelli E. (Quarantelli 1998)	This edited volume forwards multiple perspectives on disaster, providing discussion and rebuttal of the various opinions provided
12. Disasters by Design: a Reassessment of Natural Hazards in the United States	Mileti D. (1999)	Mileti's work summarises natural hazards and human coping strategies focusing on planning, land-use control, prevention and mitigation rather than simply picking up the pieces following a disaster
Additional sources: (Britton 1988, Downer 2010, Forrest 1988, Lindell 2011, Pidgeon and O'Leary 2000)		

Other important contributions include Drabek's "*Human System Responses to Disaster: An Inventory of Sociological Findings"* (Drabek 1986), Tierney et al's "*Facing the Unexpected: Disaster Preparedness and Response in the United States"* (Tierney 2001), and the Committee on Disaster Research in the Social Sciences' "*Facing Hazards and Disasters: Understanding Human Dimensions"* (CDRSS 2006) as they provide a useful and comprehensive review of the classical works of the 1950s (Lindell 2011).

The evolution of disaster research may be described as a series of peaks and troughs rather than a constant. Pioneered by Prince, it was then largely ignored until the mantle was picked up by US researchers at the Disaster Research Center established at the Ohio State University in 1963 and located at the University of Delaware since 1985 (University of Delaware 2014b). In 1973 the now defunct Bradford Disaster Research Unit was established at Bradford University in the UK (Kelman 2011). Since then, there has been a gradual increase in academic interest in disasters. Coventry University in the UK established courses in disaster management in 1994, opening the Centre for Disaster Management and Hazards Research (Coventry University 2014), and Northumbria University launched the Disaster Development Centre in 2000, and the Disaster and Development Network in 2004 (Northumbria University 2014a, Northumbria University 2014b).

Today, the number of UK universities teaching and researching disaster numbers in the dozens and in the US there are almost 100 courses ranging from Bachelor degrees to Masters and Doctoral degrees (Federal Emergency Management Agency 2013b). However, despite this seemingly positive expansion it may be argued that disaster research is perhaps at a crossroads as the traditional applied focus has been an obstacle to theoretical innovation. Many programmes recruit part-time lecturers or adjunct instructors with extensive practical experience but little or no academic understanding of the field or its historic development and practice is not always informed by research (Neal 2014, Tierney 2007 Quarantelli 2005)**.** Neal (2014) (p 3) cautions that *"our largest challenge for both the disaster science and emergency management is an anti-education/science strain that runs through our country (the US) and parts of our profession now",* highlighting a tendency within curriculum and textbook design that favours story-telling rather than theoretical advancement. This is coupled with a view that combat or military experience is somehow preferable, which strengthens the dominance of Command and Control based approaches (Dynes 1994, Neal 2014). Furthermore, much of the research is heavily westernised (Drabek 2004, Dynes 2004, McEntire 2004).

Research has traditionally been characterised by inductive field studies and there was often an ideological struggle between theoretical advancement and practical significance, whilst researchers continued to argue for a great theoretical rigour in understanding disasters (Lindell 2011, Magsino 2009, Nowell and Steelman 2015, Perry and Quarantelli 2005b, Stallings 2006).

Fortunately, this is changing, similarly to an increase in the critique of the traditional positivist ways of conceptualising disaster. This, due in part to a greater acceptance of the interpretivist and constructivist paradigms and a realisation that disaster is likely a more holistic concept that also incorporates social solidarity and conflict, and a recognition of the interaction of disaster and risk with gender, class and other axes of inequality (Tierney 2007). It may be argued that disaster research is in its infancy and as a result it is a younger sibling in comparison to the more established family of academic disciplines. The study of philosophy, medicine and the traditional sciences, such as biology, chemistry and physics, have developed over hundreds of years and become accepted as mainstream disciplines. It is questionable, therefore, to describe disaster research in a similar vein. However, a seemingly relentless series of *"disasters"* and *"catastrophes"* such as the Indian Ocean Tsunami (2004), Hurricane Katrina (2005), the South Asia Earthquake (2005), Cyclone Nargis (2008), the Haitian Earthquake (2010), super-storm Sandy (2012), super-typhoon Haiyan (2013) and the Nepal earthquake (2015) to cite a few are likely to enhance the discipline's relevance and future development as attempts are made to better understand these events. Perhaps, in a hundred or maybe a thousand years future generations of disaster scholars may view the early 21st century as the *"golden-age"* of the discipline, citing today's disaster researchers with the reverence commonly afforded by philosophy students to the works of Socrates, Aristotle and Plato.

- **Key Point 7: Disaster research is a comparatively new academic discipline**

An argument that disaster is a significant influencing factor on the physical and social development of life on Earth has been clearly stated. Their influence can be viewed as a global concern: however, a study of global emergency management is beyond the scope of this study. So this chapter focuses on Emergency Management practices within the UK and US in accordance with the stated Aim and Objectives. These countries have been selected as both have significant relevant experience, and their respective emergency management systems, practices and procedures are often considered as best practice, and cited as such by countries and industries looking to develop their capabilities (Inje University 2009, Spill Consult 2014). For a comprehensive review of UK incidents see Handmer and Parker (1992), Kapucu (2010) and Dillon (2014), and for the US incidents see Valcik (2013) and the Federal Emergency Management Agency (2014d).

The next section focuses on theoretical perspectives of Command and Control. It first provides a visual representation of both UK and US Command and Control policy, followed by the theoretical positioning of this study within the respective literature using the Disaster Management Cycle (DMC) (Coetzee and van Niekerk 2012, Neal 1997). A Theoretical Framework based on organisations perspectives, namely culture, identity, and metaphor has been created to deconstruct Command and Control, and identify limitations within the current

practice to aid the development of the CRQ. This is an essential and critical part of a successful literature review (Randolph 2009, Rocco and Plakhotnik 2009, Steward 2004).

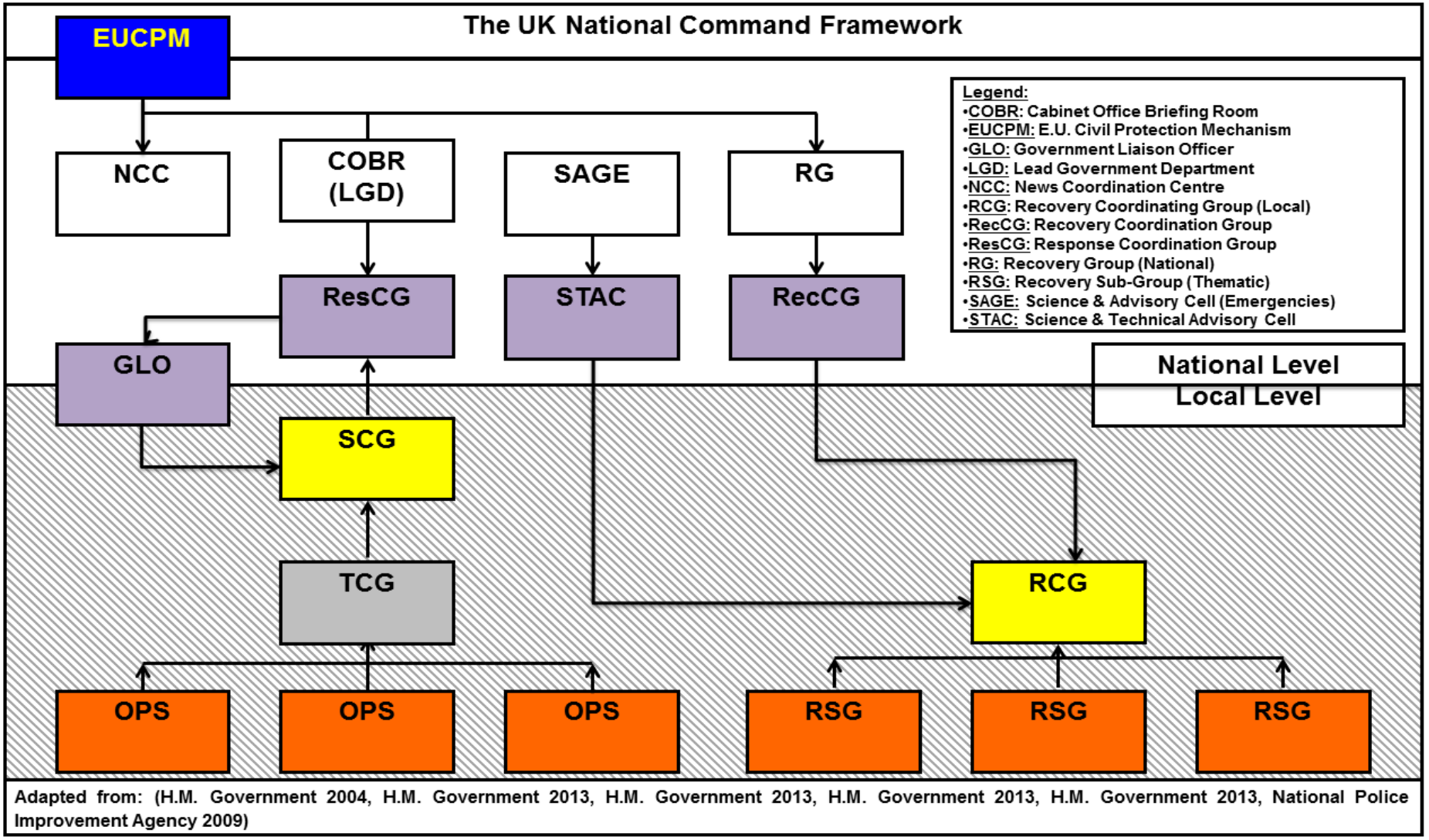
2.4 Theorising Command and Control

2.4.1 Visualising Command and Control

Visual research in the social sciences has traditionally been considered a minority field, though its influence is growing, moving the discipline beyond words (Banks and Zeitlyn 2015). Semiotics, which at its simplest is the study of signs, has a core following within the disaster literature (Chandler 2014, Chiang 2006, Morimoto 2012). Signs and symbols are used in mapping, hazardous materials, high-tech industries, and Geographical Information Systems (GIS), Management Information Systems (MIS) and emergency response equipment training (Fire Safety Advice Centre 2011, H.M. Government 2012c, Ordnance Survey 2015). Within emergency management there has been a noticeable movement away from text heavy emergency plans and Standard Operating Procedures (SOP) to leaner more concise documents, and a greater use of diagrammatic methods (H.M. Government 2011b). *"A picture is worth a thousand words"*; disasters can place immense stress on emergency responders, and when lives are endangered there is not always time to read and absorb thick text. Visual methods enable timelier assimilation of information so research of any kind in this domain is vitally important for the advancement of emergency management (Barnard 2014, Berger 2008). Accordingly, the following section visualises the social structures that form the UK and US national Command and Control frameworks. These organigrams were constructed from text-based and diagrammatic sources, primarily national and local policy documents. The organigrams below do not exist in holistic format within the literature and may legitimately be considered as a contribution to knowledge in their own right. Please note: each organigram has been verified multiple times by a cross-section of international practitioners to ensure accuracy.

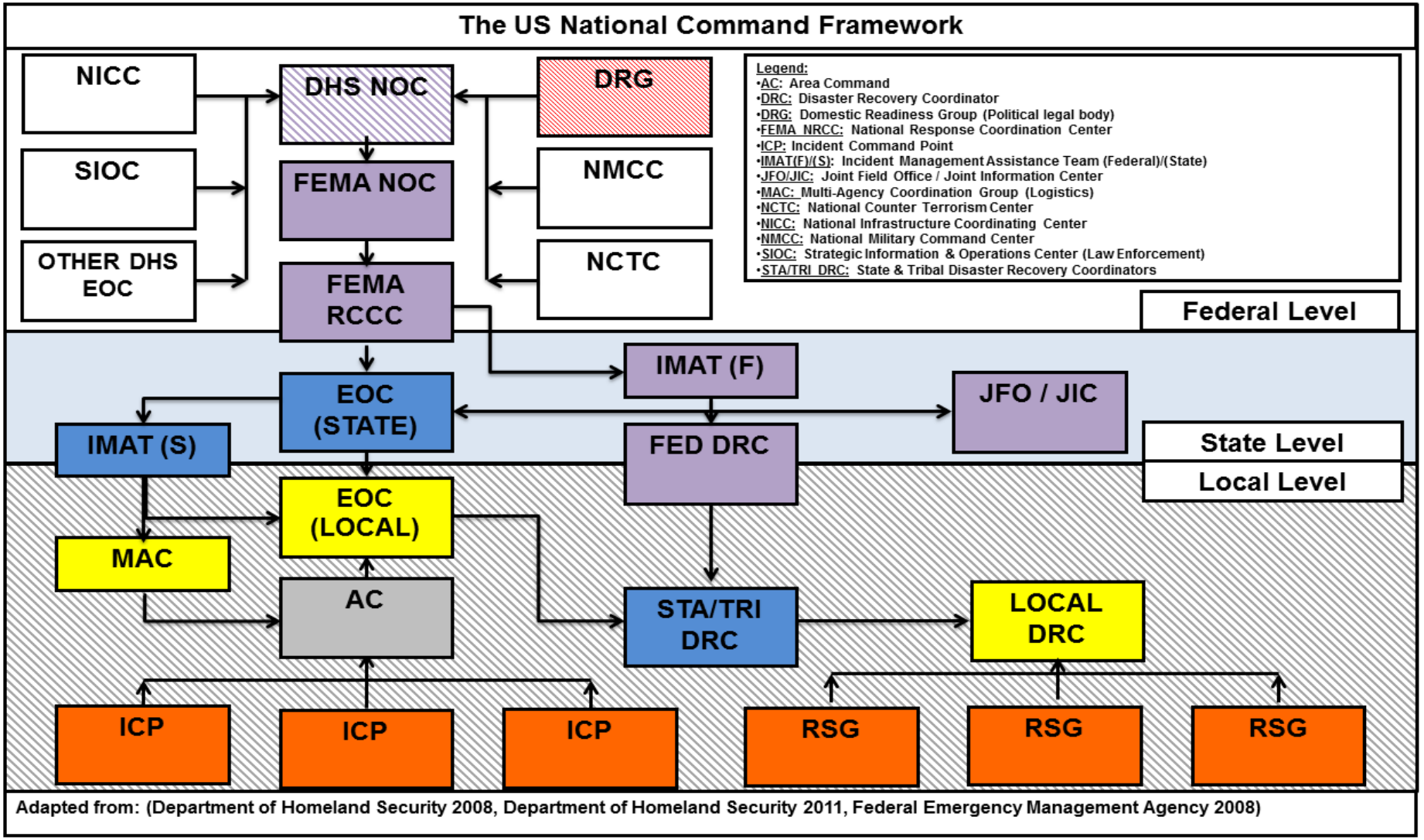
- **Key Point 8: Information defining the UK and US Command and Control frameworks is fragmented in text format across multiple policy documents; it does not exist in holistic visual format**

Organigram 1: The UK National Command Framework



Adapted from: (H.M. Government 2004, H.M. Government 2013, H.M. Government 2013, H.M. Government 2013, H.M. Government 2013, National Police Improvement Agency 2009)

Organigram 2: The US National Command Framework



Adapted from: (Department of Homeland Security 2008, Department of Homeland Security 2011, Federal Emergency Management Agency 2008)

2.4.2 The UK Command and Control Framework – Organigram 1

Organigram 1 is a visual representation of the UK national command framework and was created using the text-based sources list below:

1. The Civil Contingencies Act (CCA) (2004b)
2. Emergency Response and Recovery: Improving the UK's Ability to Absorb, Respond to and Recover from Emergencies (H.M. Government 2013b)
3. Responding to Emergencies: the UK Central Government Response Concept of Operations (H.M. Government 2013a)
4. National Recovery Guidance, (H.M. Government 2013e)
5. National Police Improvement Agency Guidance on Command and Control (National Police Improvement Agency 2009a)
6. Joint Doctrine: The Interoperability Framework (H.M. Government 2013h).

Command is devolved to the local level, which has primacy in any given emergency (H.M. Government 2013b). The heart of UK response is the 3-tiered Gold Silver Bronze (GSB) model (Groenendaal, Helsloot and Scholtens 2013, Hills 1994, National Police Improvement Agency 2009a). Initially, designed in the 1970s by the Metropolitan Police to manage civil unrest it became mandatory for UK Police services following the 1985 murder of PC Keith Blakelock, over time its use branched out into other emergency services (Hills 1994, Wessex 4X4 Response 2008).

The framework's underlying philosophy is of containment; erect a cordon around the threat/hazard at the operational level, establish command and bring in the necessary resources; as the incident becomes more complex scale up the Weberian hierarchy to ensure the requisite command infrastructure is in place (Anderson and Adey 2012, Neal and Webb 2006). Essentially, Strategic defines what is done, Tactical defines how it is to be done and Operational actually does it. The Police service has a strategic co-ordination role and they are required to ensure all organisations work together (Arbuthnot 2008). This is not to be confused with a command role as all organisations retain executive authority over their own actions and resources; though, the lead can be passed to the most appropriate organisation as necessary (London Emergency Services Liaison Panel 2012). Many day-to-day incidents and minor emergencies are dealt with at the operational level, however, the framework is scalable so a response can be ramped-up and managed either tactically or strategically, and both will be away from the scene (Arbuthnot 2008, H.M. Government 2013c). However, in the most severe of emergencies the UK national level is activated based on various defined Levels of Emergency outlined in Fig 2.8:

2.4.2.1 Levels of Emergency in the UK

Fig 2-8: UK Levels of Emergency

Level	Description
Significant Emergency (Level 1): has a wider focus and requires Central Government involvement or support, primarily from a lead government department (LGD) – see Section 2 - or a devolved administration, alongside the work of the emergency services, local authorities and other organisations. There is however no actual or potential requirement for fast, inter-departmental/agency, decision making which might necessitate the activation of the collective Central Government response, although in a few cases there may be value in using the COBR complex to facilitate the briefing of senior officials and ministers on the emergency and its management. Examples of emergencies on this scale include most severe weather-related problems. In addition, most consular emergencies overseas fall into this category with the FCO providing advice and support to those affected alongside the authorities in the country affected.	
Serious Emergency (Level 2): is one which has, or threatens, a wide and/or prolonged impact requiring sustained Central Government co-ordination and support from a number of departments and agencies, usually including the regional tier in England and where appropriate, the devolved administrations. The Central Government response to such an emergency would be co-ordinated from the Cabinet Office Briefing Rooms (COBR), under the leadership of the lead government department. Examples of an emergency at this level could be a terrorist attack, widespread urban flooding, widespread and prolonged loss of essential services, a serious outbreak of animal disease, or a major emergency overseas with a significant effect on UK nationals or interests. Examples of emergencies on this scale include the H1N1 Swine Flu pandemic, the 2007 summer floods, and the response to the 7th July bombings in London.	
Catastrophic Emergency (Level 3): is one, which has an exceptionally high and potentially widespread impact and requires immediate Central Government direction and support, such as a major natural disaster, or a Chernobyl-scale industrial accident. Characteristics might include a top-down response in circumstances where the local response had been overwhelmed, or the use of emergency powers were required to direct the response or requisition assets and resources. The Prime Minister would lead the national response. Fortunately, the UK has had no recent experience of a Level 3 emergency, but it is important to be prepared for such an event should the need arise.	
Adapted from: (H.M. Government 2013a)	

The UK Levels of Emergency are a practitioner disaster scale that contradicts Quarantelli's (2006) typology. The UK government admits in its own policy to having *"no recent experience of a Level 3 emergency"* but expects to lead a centralised, hierarchical Command and Control response from Whitehall, when Quarantelli's typology and Lagadec's concept of Hyper-

complexity, both of which are based on experience drawn from Hurricane Katrina, clearly states this is improbable, if not impossible. Indeed, over 40 years of academic research advises that this approach is likely to fail (Bissell 2013, Drabek 1985, Dynes 1983, Dynes 1994, Jensen and Waugh 2014, Lagadec 2007, McAleavy 2010, Neal and Philips 1995, Quarantelli 2002, Quarantelli 2006, Schneider 1992, Swope and Patton 2005, Waugh and Streib 2006).

- **Key Point 9: Despite *"no recent experience of a Level 3 emergency"* the UK Central Government expects to lead a centralised catastrophic response despite 40 years of research stating this is likely improbable if not impossible**

2.4.2.2 Local and Central Government Emergency Response

The Strategic Co-ordinating Group (SCG) is the collective body of Chief Officers and Executives responsible for setting the strategic direction of response operations. Depending on the incident advice may be sought from the Science and Technical Advisory Cell (STAC), which brings together specialists from various scientific fields, and is in turn supported by a national Scientific Advisory Group for Emergencies (SAGE) consisting of national and international experts (H.M. Government 2012b, H.M. Government 2013a).

Following difficulties with national situational awareness experienced during the UK floods of 2007 the framework was amended to include both Response Coordination Groups and Recovery Coordination Groups, which act as information filters between local and national levels to prevent systemic overload. These groups support the Government Liaison Officers that deploy to SCGs around the country (H.M. Government 2013a, Pitt 2008). At the apex of the UK hierarchy is the Cabinet Office Briefing Room (COBR). The most relevant Lead Government Department (LGD) coordinates support for the local response within their area of expertise, with the Prime Minister only intervening in the most severe cases. Whilst, the national media picture is managed via the News Coordination Centre (NCC) to ensure a consistent message (Gardiner 2002, Mason 2012, McConnell 2003). COBR also has the authority to request assistance from the European Civil Protection Mechanism during an emergency. Though, it is possible the politics of this may cloud the practical benefits of such action (European Commission 2015).

Please note: recovery operations are an integrated component of UK Command and Control, which is why they appear in Organigram 1. However, recovery is considered outside the remit of this study. Furthermore, the author acknowledges the UK counter-terrorism Command and Control framework is different from Organigram One, though for obvious security reasons any reference or discussion, other than this has been omitted.

2.4.3 The US Command and Control Framework – Organigram 2

Organigram 2 provides a visual representation of the US national command framework created from various text-based policy sources:

1. The National Response Framework (NRF) (Federal Emergency Management Agency 2008a)
2. The National Incident Management System (NIMS) (Department of Homeland Security 2008)
3. The National Disaster Recovery Framework (NDRF) (Department of Homeland Security 2011)
4. The Incident Management System (Federal Emergency Management Agency 2008b).

UK and US local commands are similar as they operate 3 tiers. But, the US is more formalised as the Incident Command System (ICS) management tool (see Fig 2.9) is applied at each level to ensure standardisation. Both frameworks assume *"that crises require a network of responders, but that these networks should be managed by a hierarchy"* (Moynihan 2008) (p 205). Both systems were developed independently in the late 1970s - early 1980s (Federal Emergency Management Agency 2008b, Jensen and Waugh 2014, Jensen and Thompson 2015, Moynihan 2007, National Police Improvement Agency 2009a): though, some authors date ICS slightly earlier in 1960s (Yates 1999). ICS was designed following a series of devastating California wildfires when Command and Control amongst fire-fighters was called into question; its philosophy is similar to GSB i.e. containment, cordons, establish artificial hierarchies (only exists when the incident occurs), then bring in external resources (Buck, Trainor and Aguirre 2006, Cole 2000, Laska 2011, Moeller 2008). This relative modernity highlights the speed of Command and Control's ascension to traditional and dominant status (Dynes 1994, McEntire 2007, McEntire 2015).

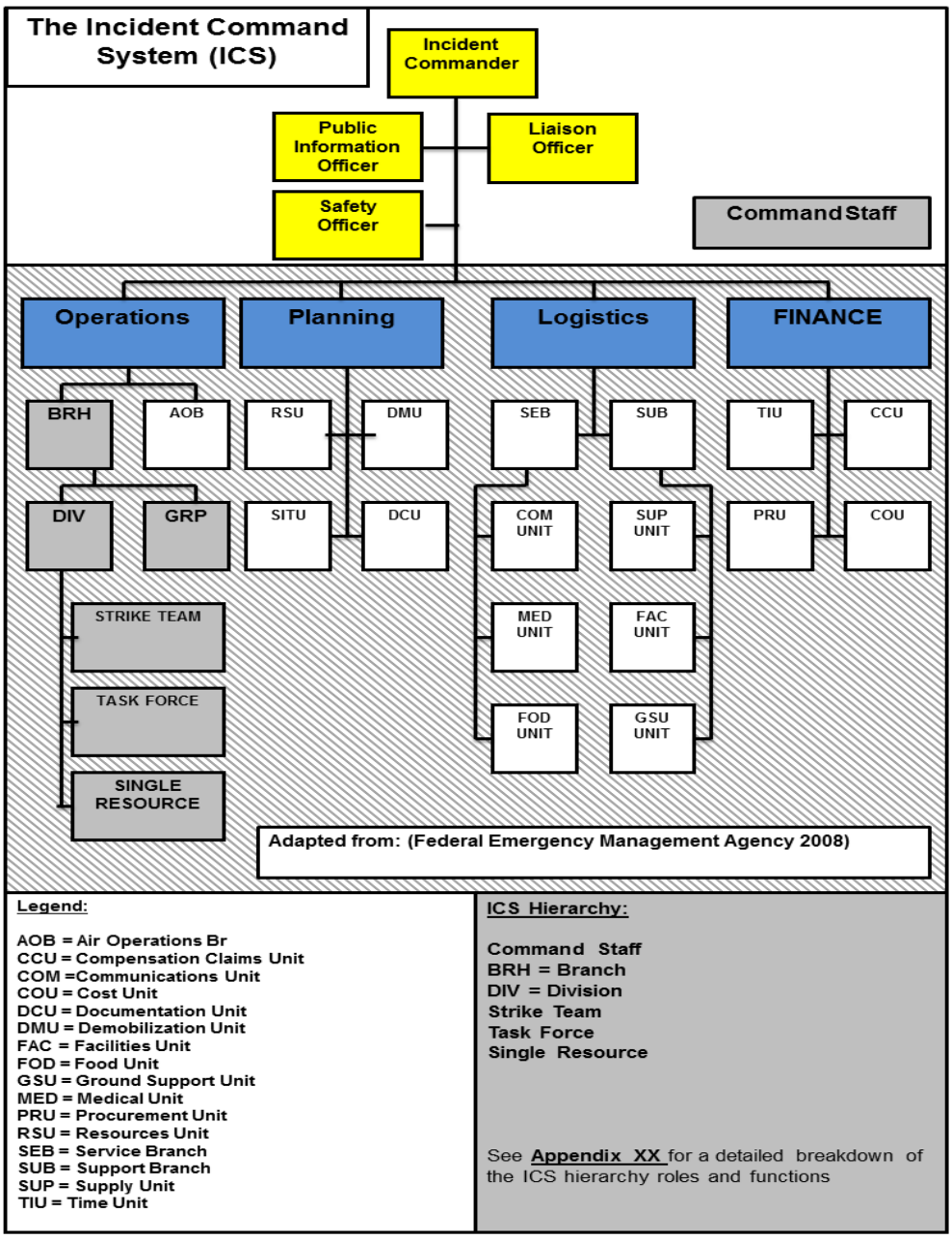
- **Key 10: Command and Control in UK and US emergency management is comparatively modern (1970s), but is so entrenched as to be considered the traditional and dominant model**

2.4.3.1 Local and State Emergency Response

The Emergency Operations Centre - Local (EOC-L), brings together the local emergency response organisations to provide strategic direction and can call on logistics support from a remote Multi-Agency Coordination Group (MAC) which provides logistics support, and should the incident threaten to overwhelm local capacity support from the State can be requested (Colorado Division of Emergency Management and Homeland Security 2011). The state Governor may deploy an Incident Management Assistance Team – State (IMAT-S) and other resources, and if necessary request either federal or inter-state assistance or both to support

the local response (Association of State and Territorial Health Officials 2014b, Department of Homeland Security 2008). Once activated the federal level can provide significant resources and capabilities.

Fig *2-9*: The US Incident Command System (ICS)



2.4.3.2 Federal Emergency Response

Each FEMA Regional Response Coordination Centers (RRCC) routinely monitors activity within their region, and can provide assistance to neighbouring RRCCs via the Emergency Support Function system (see Appendix 1) (Federal Emergency Management Agency 2014g, Federal Emergency Management Agency 2014n). Following a Presidential Declaration, a Federal Coordinating Officer (FCO) is appointed by the President to head-up a national or regional federal Incident Management Assistance Team – Federal (IMAT-F), which is deployed to the afflicted state (Federal Emergency Management Agency 2010b, Sylves 2008). If the scale of the disaster exceeds RRCC coping capacity then the FEMA National Response Coordinating Center (NRCC), which monitors national activity 24 hours a day, comes into play to co-ordinate the national federal response by linking into the wider Department of Homeland of Security (DHS), and is often led by the FEMA Administrator (Ash 2014). The DHS National Operations Centre (NOC) provides monitoring, situational awareness and co-ordination in support of FEMA operations, and the wider federal government, and access to the resources from the broad spectrum of federal agencies and services (Federal Geographic Data Committee N.D.).

At the apex of the Organigram 2 is the Domestic Readiness Group (DRG), a political body technically outside the Command and Control framework. However, its inclusion herein is relevant as it fulfils a somewhat similar function to emergency powers granted under Part 2 of the UK Civil Contingencies Act (CCA) (2004) (H.M. Government 2004d). The DRG is convened by the Whitehouse on a regular basis and is responsible for the development and implementation of preparedness and response policy, and during times of threatened or actual disaster the group provides strategic policy direction for the federal response (Hendrickson 2006).

This section has defined the core focus of this study, namely the UK and US Command and Control frameworks. As such, the focus will now shift to positioning the study within the broader literature.

2.4.4 Theories in Disaster and Emergency Management

Disaster research is comparatively recent and is inherently multi-disciplinary drawing many of its influences from the civil defence, public administration, development, geography, psychology, and sociology fields (Baird et al. 1975, Coetzee and van Niekerk 2012, Gonzalez et al. 2012, Jensen 2010a, Quarantelli 1986, Quarantelli 1997, Tierney 1998). Notwithstanding this disparate nature, the Disaster Management Cycle (DMC) is arguably one of the few theories that transcend the field; however, little consensus exists as to its origin (Baird et al. 1975, Coetzee and van Niekerk 2012, Neal 1997).

2.4.4.1 The Disaster Management Cycle (DMC)

The basic concepts that influenced the cycle's development are thought to have emerged from sociology in the 1920s-1930s. It was informed by a linear conceptualisation of disaster, consisting initially of emergency, transition and rehabilitation phases, which were established by Prince in 1920 (Coetzee and van Niekerk 2012, Prince 1920). His seminal work was the first to critically examine post-disaster behaviour focusing on temporal social-change following the 1917 Halifax harbour explosion in Nova Scotia, Canada (Dynes and Quarantelli 1992, Prince 1920, Scanlon 1988). Carr (1932) (p207) built on Prince's approach suggesting that *"social change followed a definite sequence pattern, beginning with an initiating event or condition and moving through a phase of dislocated adjustment into a phase of readjustment and eventually renewed equilibrium"* (Coetzee and van Niekerk 2012, Kreps 1984, Neal 1997)

Other studies using phased approaches began emerging as both practitioners and academics, primarily working in humanitarian response, sought a greater understanding of disaster (Coetzee and van Niekerk 2012, Neal 1997). Psychologists Powell (1954), Chapman (1962) and Stoddard (1968) helped to further establish the idea of linear progression of disaster as a viable concept, which informed the development of the DMC (Coetzee and van Niekerk 2012, Dynes and Quarantelli 1992). Despite extensive theorising and much discussion the traditional response-centric approach, based on reactive post-disaster relief, endured until the 1970s when a surge in disaster-related deaths and economic loss triggered change (Blaikie and Wisner 2004, Coetzee and van Niekerk 2012, Lewis, Phillip and Westgate 1976, Twigg 2004).

- **Key Point 11: Disaster Management was response-centric until increasing fatalities and losses in the 1970s prompted a change in approach**

The futility of waiting for disaster to occur before responding had become clear leading to the development of a more pro-active, holistic ethos. One based on assessment of disaster impacts and consequences to inform hazard prevention and mitigation and the development of response and recovery plans (Jensen et al. 2014, Lewis, Phillip and Westgate 1976), which *"seemed to be a practical and necessary component to complement traditional thinking"* (Coetzee and van Niekerk 2012) (p1). This focal change from post to pre-disaster intervention necessitated the development of new tools and conceptual frame-works to drive the field. The DMC is possibly the most important of these as it illustrates a holistic process through which complex disasters can be analysed and managed (Coetzee and van Niekerk 2012, Vasilescu, Khan and Khan 2008). The earliest cycle was developed by Baird (1975) and consisted of 6 phases: reconstruction, mitigation and predication, preparedness for relief, warning, relief and rehabilitation. Subsequently, numerous variations have been proposed, the United Nations Development Programme advocated 5-phases, and Alexander (2002a) posited 4 phases, whilst other examples adopt over-arching pre and post disaster variations, which compound

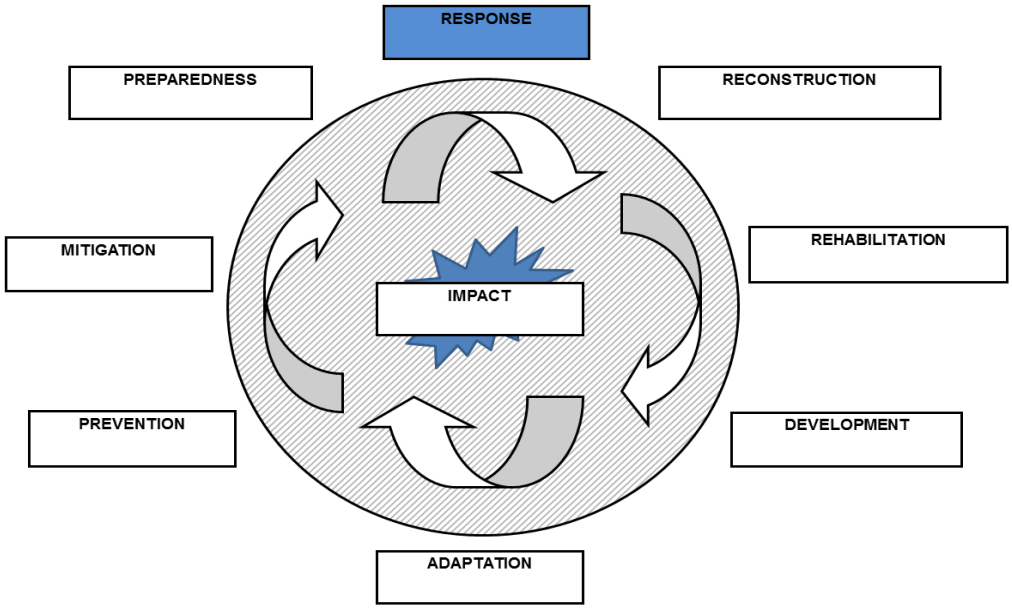
efforts to clearly map-out DMC evolution (Coetzee and van Niekerk 2012). Richardson (2005) (p27) argues *"phase models were developed to assign order and rationality to the very messy, complex reality of natural and technological disasters and human responses to them"* thus the cycle is both a theoretical and applied tool as it supports academic understanding, whilst also enhancing practice.

The DMC is not societally or culturally specific, it can be applied to any given sector, organisation or community; in that sense it is as relevant today as when it was first developed because there is an increasing realisation that *"disasters"* and *"catastrophes"* affect everyone so holistic whole community approaches are increasingly relevant (Berkes and Ross 2013, Coles and Buckle 2004, Federal Emergency Management Agency 2011, Federal Emergency Management Agency 2014m, H.M. Government 2011a, Kapucu 2015).

2.4.4.2 Critique of the DMC

At its most basic, the DMC consists of 4 phases - mitigation, preparedness, response and recovery and can be used to breakdown and analyse a disaster. Prior to the event mitigation and preparedness activities take place. When a disaster occurs a response ensues followed by a process of recovery then rehabilitation of the impacted community (Baird 2010, Lincoln County Emergency Management Agency 2009, Vasilescu, Khan and Khan 2008, Warfield 2008). Fig 2.10 below illustrates a hybrid DMC, combining various perspectives by splitting the recovery phase into 3 elements for clarity, and including a much debated (pre and/or post disaster) adaptation phase (Coetzee and van Niekerk 2012, Warfield 2008). Adaptation occurs inherently within all phases, though for the purposes of this study the overt inclusion of a separate adaptation phase is conceptually justifiable.

Fig 2-10: The Disaster Management Cycle



Adapted from: (Coetzee and van Niekerk 2012, Haddow, Bullock and Coppola 2011, Vasilescu, Khan and Khan 2008, Warfield 2008)

Despite its theoretical contribution the DMC is open to legitimate criticism. Firstly, many disasters, particularly sudden impact events, occur without warning so cannot be prevented or mitigated negating the pre-disaster elements. Secondly, the delineation of phases can be somewhat arbitrary as there is substantial crossover between activities, which varies from disaster to disaster. Thirdly; a linear time-based model, whether simple or complex, is not comprehensive enough to conceptualise disaster fully as emergency response generally overlaps with recovery operations despite formal handover procedures (Barton 1969, Bowden, Haas and Kates 1977, Hogg 1980, Neal 1997). Furthermore, the cycle is hazard-centric, built around a focusing event such as a hurricane or a tsunami, which limits its applicability to slow-onset and chronic disasters such as health epidemics, poverty and social injustice (United Nations Office for Disaster Risk Reduction 2015, United Nations 2015).

2.4.5 Positioning the Study within the Field

Notwithstanding the criticism, the DMC serves an important function as it visually illustrates the range of interlinked fields within disaster research. Each phase represents a distinct but connected body of literature. Thus, the cycle provides a mechanism to categorise this literature and effectively position this study within the broader field. In this case, the area of interest is Command and Control, specifically within emergency management in the UK and the US, which sits within the response phase, marked in blue on Fig 2.9. As such, the selected literature was aligned to this phase. However, due to the inherently multi-disciplinary nature of the field the author had to make assessments as to the relevance and importance of literature that spanned several phases in line with the Aim and Objectives. Literature that clearly aligned with other phases was considered beyond the scope of this study and omitted.

- **Key Point 12: The DMC provides a mechanism to position the study within the broad range of literature**

2.4.6 Humanitarian and Emergency Response

Conceptually the response phase can be programmatically split in two. Humanitarian response, which is considered as activities conducted in relation to international disasters overseas, whereas emergency response is termed emergency management within the geographic confines of the UK or US. Similarly, both the literature and practice is also split, though it can be argued that this is somewhat artificial as they share a similar core. Irrespective of disaster type, location and organisations involved the fundamental skills; knowledge and experience needed for effective management are fundamentally similar. Though, the respective domains are made-up of different organisations, either formally or informally

constituted, with differing cultural and sub-cultural norms, values and identities which are all brought together in often stressful multi-agency social environments when disaster occurs (Dacin, Goodstein and Scott 2002, House et al. 2002, McAuley, Duberley and Johnson 2006). This blend of cultures, identities and organisations impacts on Command and Control, and it is this dynamic, which is of research interest. Interestingly, noted authors, such as Manyena (2014), who traverses the disaster management, geography and environmental sciences literature, vehemently criticise the funnelling of international development and disaster risk reduction activities through the narrow lens of Command and Control, arguing that it inhibits resilience building in the developing world. This criticism is notable given that historically the basis for disaster response around the world is routed in collaboration between family, kin and social groups rather than formal organisations (Dynes 2000b). Consequently, there is much to be learned from greater research interaction. Though, given a noted lack of research informed practice; it is likely unrealistic to hope for such collaboration in the near future (CDRSS 2006, McEntire 2010, Neal and Webb 2006, Neal 2014).

2.4.7 Emergency Response

Vehicles with flashing lights and sirens are readily associated with emergency response, certainly in the UK and US context. To the layman, images of police officers, fire-fighters and paramedics undertaking their duties are likely to come to mind when asked about disasters and their response. However; the range of organisations involved is much broader, requiring significant multi-agency interaction and co-ordination in the form of Command and Control. This approach is considered by Dynes' (1994) (p 142) as the dominant model and McEntire (2015) (p 112) as the traditional model of emergency response, an overview of which provided in Fig 2.11 below:

Fig 2-11: The Traditional Model of Emergency Response	
Strengths	**Weakness'**
1. War may have the most adverse impact of any disaster	1. Natural and technological disasters are more common
2. Government is an important factor in disaster response operations	2. Government is not the only actor in disaster response operations
3. Standard Operating Procedures (SOP) provide logical guidelines for routine emergency situations	3. SOP's cannot provide guidance in all types of disaster situations
4. Hierarchy and orders may save lives and help to get things done	4. Top down structures may be slow or hinder the response
5. The desire to bring order to disaster is natural and to be expected	5. There may be order in chaos
Adapted from: (McEntire 2015) (p 112)	

The traditional model, or rather Command and Control frameworks based on its principles, have been heavily criticised (Dynes 1994, Groenendaal, Helsloot and Scholtens 2013, McEntire 2015, Neal and Philips 1995, Waugh 2009c, Wenger, Quarantelli and Dynes 1990), though its influence on practice remains strong. For a comprehensive review of associated literature see Jensen and Waugh (2014) and Jensen and Thompson (2015). The professional model (see Fig 2.12) advocates a more collaborative all-hazards perspective as an alternative. It recognises a broader range of stakeholders beyond emergency services focusing on integrating efforts in a flexible manner (McEntire 2007, McEntire 2015, O'Leary and Blomgren-Bingham 2009). The model promotes a broader interpretation of disaster that accepts that there may be order within chaos, acknowledging that communities and individuals can and will help themselves post disaster (Dynes, De Marchi and Pelanda 1987, Dynes 1994, McEntire 2015, Tierney, Bevc and Kuligowski 2006). This clashes with the traditional assumptions of Command and Control, and is arguably more aligned with the significant body of disaster sociology research, which concludes that pro-social rather than anti-social behaviour generally occurs post-disaster (Britton 1988, Dynes 1970, Dynes 1973, Dynes, De Marchi and Pelanda 1987, Forrest 1988, Quarantelli and Dynes 1977, Quarantelli 1986, Rodriguez, Trainor and Quarantelli 2006, Tierney 1998), though the need to bring order to chaos still pervades practitioner and policy narratives (Tierney, Bevc and Kuligowski 2006).

Fig 2-12: The Professional Model of Emergency Response	
Strengths	**Weakness'**
1. Takes and all-hazards approach	1. Downplays unique difficulties of war-time disasters
2. Acknowledges many actors	2. Downplays the role of government and first responders
3. Stresses integration of involved parties	3. Fails to recognise the importance of hierarchical leadership
4. Allows for improvisation	4. Overlooks the benefit of Standard Operating Procedures (SOP)
5. Accepts a broad picture of disaster	5. Fails to see details of field level operations
Adapted from: (McEntire 2007) (p 101)	

Command and Control is seen as *"the"* model of choice for many, including humanitarians (Evans 2015a, Overseas Development Institute 2015). Command and Control is fundamental to UK and US emergency response, it is enshrined at the heart of legislation and policy. The UK GSB framework is mandated in Part 1 of the CCA (H.M. Government 2004c) and within the *"Responding to Emergencies: the UK Central Government Response Concept of Operations"* policy (H.M. Government 2013a). In the US, it underpins the *"National Response Framework*

(NRF)" (Federal Emergency Management Agency 2008a), the *"National Incident Management System (NIMS)"* (Department of Homeland Security 2008) and the *"Incident Command System (ICS)"* (Federal Emergency Management Agency 2008b). Command and Control is the underlying philosophy of emergency response and in light of this criticality an in-depth investigation is not only logical but also essential in the context of this study as *"despite its presumed significance our scientific knowledge of Command and Control is still rather limited"* (Groenendaal and Helsloot 2015) (p1).

2.4.7.1 What is Command and Control?

Command and Control literature can be split into 2 inter-linked sub-domains namely technological and social research. There is a significant body focused on technological enhancements, as software-based Incident Management Systems (IMS) are critical to day-to-day emergency response operations. There are numerous systems on the market, such as Storm (Sopra Steria 2014), Atlas Incident Management System (Ultra Electronics 2015) and Vector Command (Vector Command 2015). These have increased the effectiveness of global response operations over the past 30 years (Curka et al. 1993, Moynihan 2005, Rimstad and Braut In Pres, Slovis et al. 1985). Key research themes include communications (Bellini et al. 2013), dispatch and resource allocation (Brackett 2008), information-sharing (Bai, Wang and Zhang 2014, McMaster and Baber 2012) and situational awareness building (Bimson, Slim and Heileman 2014, Roth et al. 2009), decision-support (Hawe et al. 2012, Wilson et al. 2011) and training and simulation (Cohen et al. 2013a, Cohen et al. 2013b) amongst others.

- **Key Point 13: Command and Control research encompasses both technological and social domains**

2.4.7.2 Interoperability

A key crossover between technological and social Command and Control research is the concept of interoperability as the literature spans multiple sub-domains. Furthermore, Joint working is a key-concept within emergency management (House, Power and Alison 2014). Though, it has primarily been misrepresented as a technological issue as *"in the past, research has tended to focus on the compatibility of the technology and equipment used by the responders"* (Cole 2010) (p vii). The confusion is understandable; the UK Civil Contingencies Secretariat (CCS) developed an Emergency Responder Interoperability Lexicon in 2010, but did not actually define the term *"interoperability"* within the document (H.M. Government 2013f). However, it is now a key concept within the *"Joint Doctrine: the Interoperability Framework",* and is defined as *"the extent which organisations can work together coherently as a matter of routine"* indicting a broader conceptualisation of the term (H.M. Government 2013h) (p 2). Though, other definitions were in use (see (National Police Improvement Agency 2009b), and (North Atlantic Treaty Organisation 2006), until the advent of the Joint Emergency Services

Interoperability Programme (JESIP), which promotes joint-working amongst UK Ambulance, Fire and Police services only. The UK government launched a consultation to *"enable closer working between the emergency services"* in September 2015, indicating that interoperability problems currently exist between the core emergency services, never mind within and across the wider responder community (H.M. Government 2015, H.M. Government 2016). *"Inter-operability is not just about technology it is about people and process"* (Cole 2010) (p vii). It is this ethos that provides the research driver. Command and Control is a diverse and multi-faceted idea, it has technical and social elements, so logically it may be understood and conceptualised in a variety of ways by different groups of people so this study will now focus accordingly.

- **Key Point 14: Interoperability is about people and processes, not just technology**

2.4.8 Management Theory and Command and Control

Parker, cited in Rao and Venktram (2010) (p 3), defines management simply as the *"art of getting things done through others"*, whereas Ivancerich et al (1991) (p 5) defines it more expansively as *"a process undertaken by one or more to co-ordinate the activities of other persons to achieve results not attainable by any one person alone".* Numerous definitions exist and a comprehensive analysis of their merits is beyond this study: however, what is clear is that management is a process that centres on people. This section focuses on management theory as the over-arching domain of Command and Control. The study of management often begins with the classical period, however; any study must acknowledge the contributions of the pre-classical so a synopsis of the key theorists is outlined in Fig 2.13.

Fig 2-13: Pre-Classical & Classical Management Theory	
Robert Owens (1771-1858)	Considered the pioneer of Human Resource Management; advocated the necessity of worker welfare
Charles Babbage (1792-1871)	Inventor and management scientist. Invented the calculator, advocated ideas of specialisation of mental work and the necessity of profit-sharing
Andrew Ure (1778-1857)	Emphasised the need for management training paving the way for professional managers
Henry Robinson Towne (1844-1924)	Reviewed pre-classical theories concluding their emphasis was on developing techniques linked to technical expertise,

	thus management was not previously considered as a separate field
Classical Management Theorists	
Fredrick Taylor (1856-1915)	**Scientific Management**: "best way of doing things" through simplifying complex tasks into sequences to improve productivity
Frank Gilbreth (1868-1924) and Lillian Gilbreth (1878-1972)	**Time and Motion studies:** concerned with the relationship between human beings and human effort to determine the optimum way of doing things
Henri Fayol (1841-1925)	**Administrative Management:** Fayol believed management was more than just work, he developed 14 principles advocating that manager's should organise and interact with staff
Max Weber (1864-1920)	**Bureaucracy:** a system of control, leaders exercise control through discipline. Jurisdictions are clear, hierarchical principles and rules, means of administration and production belong to the office, officials are selected on skill rather than elected and employment is a career
Adapted from: (Allen 2004, Disha Management 2015, Taylor 1910, The Gilbreth Network 1968, Wren, Bedeian and Breeze 2002)	

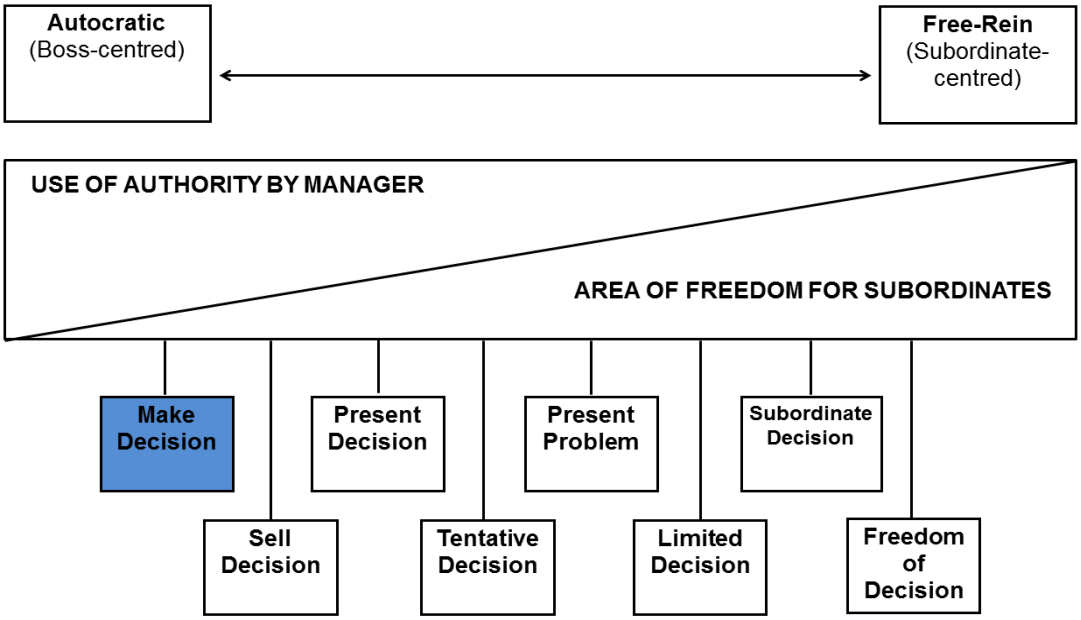
2.4.8.1 Command and Control as a Management Style

Management theory has evolved into a diverse, broad field. Rather than replacing the classic theories, new perspectives have tended to evolve over time. Command and Control spans most domains of management. The social dimension of Command and Control is humorously defined by Spolsky (2006) who captures its ethos in a clearly tongue-in-cheek manner stating *"primarily, the idea is that people do what you tell them to do, and if they don't, you yell at them until they do, and if they still don't, you throw them in the brig for a while, and if the doesn't teach them, you put them in charge of peeling onions on a submarine, sharing two cubic feet of personal space with a lad from a farm who never quite learned about brushing his teeth".* Spolsky (2006) clearly frames Command and Control as a management style, illustrating its militaristic origins. There is a certain irony that a management style used by military forces to take life is also viewed as the traditional and dominant model to save life: the antithesis of warfare (Drabek and Evans 2007, Dynes 1994, National Ambulance Resilience Unit N.D.).

- **Key Point 15: Command and Control is considered both the traditional and dominant model for emergency management**

As a management style Command and Control is autocratic and associated with militarism. Bass (1985) proposed a continuum with autocratic practices at one end and democratic at the other, with iterations along the continuum (Avery 2004). This approach builds upon the earlier seminal work of Tannenbaum and Schmidt, which is a widely cited theory at many Business Schools (Management Study Guide 2013, Tannenbaum and Schmidt 1973).

Fig 2-14: Tannenbaum and Schmidt's Continuum



Adapted from: (Management Study Guide 2013, Tannenbaum and Schmidt 1973)

The widely accepted nature of Tannenbaum and Schmidt's continuum offers validity to its use as a critical evaluative tool. The combination of Spolsky's perspective viewed through the lens of the Tannenbaum and Schmidt continuum suggests that Command and Control is a limited theoretical concept as the fundamental philosophy on which this, the dominant approach (Dynes 1994), is based is restricted to the autocratic extremes of the available spectrum: illustrated by the blue Make a Decision node on Fig 2.14.

- **Key Point 16: As a management style Command and Control is aligned with the autocratic domain**

The rationale behind this distinctively autocratic posture is understandable when considered from the perspective of a military commander. In life or death combat situations, a military commander needs to be sure they can issue orders and soldiers will obey them (Halvorson

2010). To this end, military training is designed to ensure that during combat soldiers will routinely risk injury and/or death rather than face the wrath of their superiors by disobeying a direct order (Spolsky 2006). The Prussian King Frederick the Great instilled this quality within his armies and achieved significant military success during the 18th century Silesian Wars (Browning 2005). He famously stated, *"soldiers should fear their officers more than all the dangers to which they are exposed. Goodwill can never induce the common soldier to stand up to such dangers; he will only do so through fear"* (Luvaas 1995).

Military Command and Control is autocratic to ensure compliance and maintain authority to enable forces to destroy an enemy. Military objectives can include the killing or disablement of an enemy, or the taking and holding of territory, where the sacrifice of personnel and/or resources is permissible although generally not desirable (Schoomaker 2003). Conversely, an emergency manager's objectives are focused on the preservation of life and property, and the sacrifice of personnel and/or resources is generally considered a failure (Boersma et al. 2014). For example, 343 fire fighters were killed during the 9/11 attacks, many as a result of *"mayday"* calls that went unheard due to a failure of the New York Fire Department radio systems. The legal and moral battle to find answers and apportion blame continued for years following, highlighting the unacceptable nature of losses (New York City Fire Department 2010). These objectives are fundamentally different: however, the organisations share an autocratic leadership style. It can be argued the ability to direct subordinates to take action and to face danger, whether in combat or in the fiery inferno of the burning World Trade Centre, is a beneficial trait. Perhaps this is why Command and Control is dominant in both fields (Dynes 1994). The diametric nature of these objectives again raises the paradox of why the model is considered appropriate for both the taking and saving of lives?

2.4.8.2 The Evolution of Command and Control

Modern technology has broadened the complexity and scope of Command and Control though its fundamental purpose has remained constant for millennia (US Navy 1995). Sun Tzu's 4th Century BC *"the Art of War"* is perhaps the earliest known written military doctrine and is considered as *"the"* definitive historic work on military strategy (Giles 1910). It is essentially a Command and Control manual, which details strategies for planning and co-ordinating battlefield manoeuvres. Sun Tzu's maxims have influenced eastern philosophy for over 2,000 years and his global influence is considerable. The text is essential reading at numerous military academies, and it has crossed over into mainstream literature (Krause 1995, Michaelson 2001, US Military Academy 2004).

2.4.8.3 Phalanx Warfare: The Dawn of Military Command and Control

The phalanx is one of the more iconic, albeit brutal, methods of warfare, which can be can be traced to around the 25th century BC (Lendering 2005). A phalanx comprised of elite hoplite

infantry soldiers aligned in ranks of 4 deep in close order, armed with a helmet, shield and spear. The hoplites locked their shields together and the first few ranks projected their spears out over the first rank, presenting a shield wall and a mass of spear points, to the enemy (Cartledge 2003). Phalanx warfare was a complex activity, requiring close teamwork, esprit de corps and selflessness. It was a step-change from earlier smaller-scale warfare, which relied on individual soldier's skill-at-arms rather than collective might (Homer 1998). It was designed to suppress single combat for the good of the whole, as the resulting collective power was significantly more potent than that of an individual. Within the phalanx, each hoplite held his shield with his left arm, protecting himself and the hoplite to his left; success relied on how well the hoplites could maintain this formation during combat. A simple but effective Command and Control system managed complex battlefield manoeuvres. A commander at the rear issued orders via a musician. Subordinate commanders positioned in each rank, upon hearing these orders, controlled the timing of movements by initiating battlefield hymns, which kept the phalanx in close order (Basar 2006). This approach proved so effective that derivatives of the method are still used in today's militaries in the form of parade drill and Tactical Advance to Battle (TAB) (Murray 2000, Parris 2004).

The increasing scale of warfare, which expanded from village/town level to city-state versus city-state, to country versus country and then to multi-national coalition warfare provided the catalyst that spawned military Command and Control enabling it to continually evolve (Cartledge 2003, Gilbert 2008, Moore 2004, West and Smith 2003). This exponential increase reached a pinnacle in the 20th century, with 2 World Wars and a subsequent Cold War (McEntire 2007). As battlefields and armies expanded the need for a management style that ensured compliance and the maintenance of a commander's authority over greater distances resulted in the entrenchment of autocratic principles.

Command and Control is critical to military success and despite advancements in technology the fundamental purpose remains the same i.e. to ensure young men and women go into harm's way to engage an enemy. Perhaps, the capabilities to direct action, maintain span of control and situational awareness led to the emergence of Command and Control as the traditional model (McEntire 2015)? This suggests that noting these benefits and perceivable similarities between warfare and disaster someone chose this approach (Chaudhury, Nibedita and Mishra 2012). Although feasible, this is a somewhat naive argument as its emergence within this field is more likely a reflection of the norms and values of the early emergency managers and the paramilitary organisations they represented, rather than the result of a considered strategic decision.

- **Key Point 17: Command and Control is an ancient military approach some 4,500 years old**

2.4.8.4 Command and Control: Transition to Civilian Emergency Response

Autocratic management styles were embedded within society during the industrial revolution (1760-1840), which brought about a step change in working practices (Unyimadu 1989). Prior to this the primary societal driver of the earlier agrarian economy was the sun, which dictated a working schedule that began work at dawn and stopped at dusk. The industrial revolution altered this and the sun no longer controlled the labour force but instead they did as their industrial masters instructed in return for a wage, leading to a wider societal familiarity with the autocratic management style (Bendix 2001). The increasing scale of warfare throughout the 19th and 20th century embedded this cultural phenomenon, peaking during World War I when over 70 million military personnel were mobilised world-wide (Gilbert 2008). The resultant post-war labour force generally accepted autocracy, which was then further entrenched by mass-militarisation during World War II, leading to its widespread industrial use during the first half of the 20th century (Bendix 2001).

These occurrences laid the groundwork for the emergence of Command and Control within modern emergency management. The increased governmental interest in civil emergency management in the late 1940s-1950s brought about by the Cold War saw civil defence offices appear as western governments attempted to prepare civilians for atomic attack through drills and field exercises (Davis 2007, Dillon 2014, McEntire 2007). Civil defence was driven by government, military organisations, and paramilitary emergency services. As such, Cold War era civil defence practitioners were well versed in Command and Control and at ease working in autocratic hierarchies on account of their respective cultures and identities (McEntire 2007). Rather worryingly, this suggests Command and Control seeped into Cold War civil defence rather than actually being selected as a fit-for-purpose managerial approach.

As the Cold War drew to a close the civil defence remit began to change. The approaches used to protect civilians against nuclear aggression were applied to civil disasters (McEntire 2007): Civil Defence morphed into civil protection (Alexander 2002b). The diminishing threat of nuclear attack saw a reduction in the size of the armed forces and the dismantling of the Civil Defence apparatus (Davis 2007). Consequently, many former military and paramilitary personnel transferred to civil emergency management bringing their autocratic norms and values with them (ibid). Thus, Command and Control's dominance is due to an influx of personnel and a transferal of cultural norms and values. Indeed, the associated practices may simply have been the *"way we've always done it"*.

Support for Command and Control grew amongst practitioners before 9/11 in both the UK and the US (Buck, Trainor and Aguirre 2006, Jensen and Waugh 2014, Tierney 2001, Waugh 2009a). Indeed, practitioners have long sung the praises of the perceived benefits of Command and Control frameworks such as the US ICS (Cole 2000, Jensen and Thompson 2015, Trainor

2004, Trainor 2004, Wenger, Quarantelli and Dynes 1990). This trend continued following 9/11 with Presidential Declaration Five (PPD5), providing a legislative base for the *"National Incident Management System (NIMS)"* (Jensen 2010b, Jensen and Waugh 2014, U.S. Government 2003). The attacks also influenced the development of the UK CCA, which became more centralised, hierarchical and focused on counter-terrorism (O'Brien 2006). This despite, the US National Research Council (P 142) stating that *"empirical research… finds essentially no support for the Command and Control model either as a heuristic device for conceptualizing disaster management or as a strategy employed in actual disasters"* (CDRSS 2006, Jensen and Waugh 2014). This demonstrates that understanding of Command and Control is fragmented at best validating the need for this research.

- **Key Point 18: The emergence of Command and Control in UK and US emergency management is most likely the result of a transfer of personnel, culture, practices, norms and values**

Command and Control is fundamental to practice; both UK and US frameworks are centralised, top-down hierarchies, which operate as push-pull mechanisms (Anderson and Adey 2012, Neal and Webb 2006). Local responders can pull support and resources as needed and in the most extreme of circumstances the national level can push resources down as command remains at the local level (Radvanovsky and McDougall 2013). Despite this centrality, a holistic and universal perspective was not forthcoming; rather what was evident was an overwhelming top-down focus of Command and Control as either GSB or ICS (i.e. a local focus) within the literature, particularly diagrammatic representations. This is indicative of a fragmented awareness of Command and Control noted by Drabek (1985), and seemingly a holistic conceptualisation is still lacking today.

- **Key Point 19: Drabek identified a fragmented awareness of Command and Control in 1985; Information relating to the respective frameworks is still split across numerous policy documents so conceptualisation remains fragmented**

2.4.9 Command and Control: Academic versus Practitioner Viewpoints

Opinions on Command and Control vary; practitioners tend to be supportive of the model though their views often lack supporting evidence (Neal 2014), whereas the academic literature is split containing both positive and critical perspectives. For example, Chaudhury et al (2012) (p 256) states *"only the government is the solo organization who will act and take necessary actions to disaster"* presenting a distinctly traditional view. Cole (2000) (p 203) hails ICS as the *"world's leading management system for the command, control and co-ordination of emergency scenes"* so both authors are clearly in favour of the approach. However, these perspectives are at odds with many disaster sociology perspectives. Quarantelli (2002) (p1), is scathing in

his criticism stating *"most disaster researchers who have systematically studied disaster management for more than 40 years, think that this is a poor model for managing at times of crises"* – the full letter is contained in Appendix 2. Academic criticisms of Command and Control predate the current UK and US frameworks and noted systemic failings are summarised in Fig 2.15 below:

Fig 2-15: Summary of Criticisms of Command and Control	
Criticism	**Implications**
Inflexible structure	Cannot readily adapt to dynamic situations
Bureaucratic	Too much *red tape*
Overly centralised	Chain of command vulnerable to disruption
Myth of command	1 person cannot feasibly be in charge of everything in a disaster
Hierarchical	Authorisation required before action can be taken, which can delay response operations
Assumption of disaster zone chaos	Ignores 50 years of disaster sociology findings
Restriction of emergent behaviour	Citizens do not respond to disaster mentality
Sources: (Buck, Trainor and Aguirre 2006, CDRSS 2006, Dynes and Quarantelli 1968, Dynes and Quarantelli 1968, Dynes 1983, Dynes 1994, Groenendaal, Helsloot and Scholtens 2013, Jensen and Waugh 2014, Kapucu 2006, McAleavy 2010, McEntire 2015, Neal and Philips 1995, Quarantelli 1986, Quarantelli 2002, Quarantelli 2006, Swope and Patton 2005, Tierney 2001, Tierney 1998).	

A theoretical alternate to Command and Control exists, namely the Emergent Human Resource Model (EHRM), posited by the noted disaster scholar Russell Dynes in 1981, which advocates decentralisation, co-ordination and collaboration. Lamentably, however dialogue remains within a small group of works and it is ignored in practice (Drabek 1985, Dynes 1981, Dynes 1994, Neal and Philips 1995, Webb 2014).

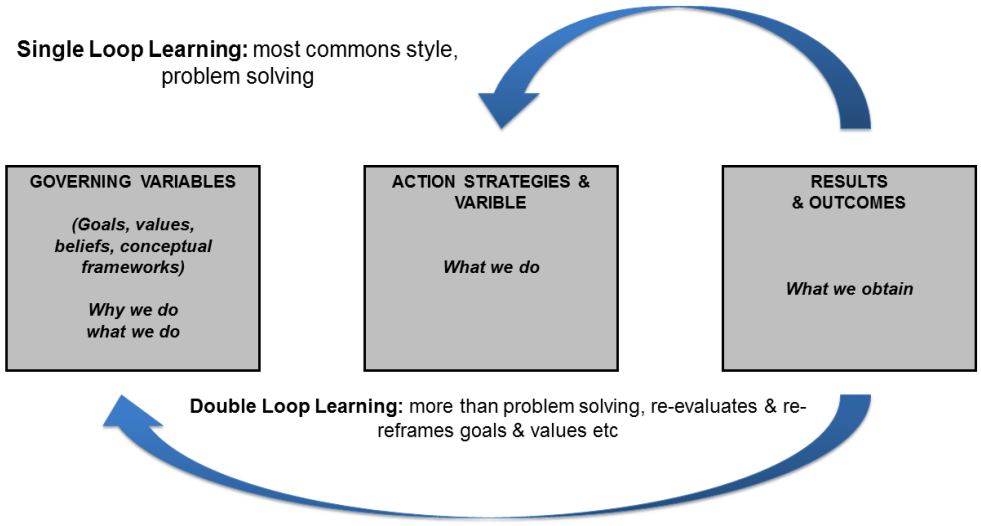
- **Key Point 20: Academic criticisms of Command and Control are generally not reflected within practice**

Practice does not fully embrace academic perspectives though this stance is softening (Jensen et al. 2014, Neal 1993, Neal 2014, Quarantelli 2005, Rubin 2009, Smith and Wenger 2006, Tierney 2007), and is often focused on improvements within Command and Control (Bearman

et al. 2015, Breimyer 2011, Davis 2005, H.M. Government 2013c). Scholtens et al (2014) argues for a shift in paradigm. However, the posited decentralisation of operational level decision-making in Dutch emergency response whilst likely to increase effectiveness is conceptualised within the existing Command and Control framework so is arguably not a paradigm shift at all. Similarly, JESIP is also indicative of what is known as a single-loop learning process, whereby the practitioner community is simply evaluating and improving *"what we do"* rather than questioning more deeply *"why we do what we do"* (Argyris 2002, Houchens et al. 2012). Indeed, Moynihan (2007) (p 5) noted *"while the ICS was not used successfully in Katrina, none of the subsequent after-action reviews questioned the basic wisdom of the ICS approach".* These factors provide validation for this study as chronological and experiential learning of Command and Control is around 40 years and limited to a single-loop process meaning there is considerable scope for research.

- **Key Point 21: Practitioner Experience of Command and Control is limited to 40 years based of single-loop chronological and experiential learning**

Fig 2-16: Single and Double Loop Learning Process



Adapted from: (AFS Intercultural Programs 2015)

2.4.10 Theoretical Developments in Disaster Research

The disaster research community consists of 3 groups; core researchers who focus entirely on disaster, secondary researchers who occasionally dip in and out of the field, and tertiary scholars that are affected by disaster sparking a temporal interest in the field, though they generally return to their original specialties (CDRSS 2006, Tierney 2007). Consequently, the field is quite small, though as a relatively young and specialist discipline this is perhaps to be expected. The field is best characterized as having a traditional focus on problem solving,

arguably to its detriment in terms of theoretical development. Funding bodies tend to have specific problems so researchers tailor their work to meet these requirements so at present there is a need to pursue *"blue-sky"* thinking to push the theoretical boundaries just because we can: science for science's sake (Neal 2014, Quarantelli 1993).

Disaster research has lacked coherent theorising due to this applied focus: but, the field is not entirely devoid of theory. Early research adopted systems perspectives whereby disasters were viewed as disruptions to social systems (Barton 1969, Dynes 1970). Later, natural hazards perspectives advocated social adjustments such as hazard avoidance, land-use planning and building codes to prepare for disasters, which has expanded to focus on all phases of the DMC. The combination of systems and natural hazards perspectives provide the foundations of the contemporary field and are generally attributed to the works of Quarantelli, Dynes and White, however, as noted by Scanlon (1988) the name of Prince should be venerated alongside this esteemed list (Neal 2014, Prince 1920, Tierney 2007).

Constructivist perspectives have become increasingly prevalent with Spector and Kitsuse's (1977) works on interpretations of floods as either natural or human phenomena (Best 2002), and Stallings (1995) work which demonstrated that a lack of public concern, scientists' interest and political will converged to construct earthquakes as a critical social problem in California forming the mainstream global narrative (Tierney 2007). Other notable perspectives include conflict, with a strong view arguing that during disaster social cohesion improves (Barton 1969, Drabek 1986, Dynes 1970). There is an alternate narrative however: whereby existing social-tension continues following existing patterns in disaster also exists within the literature (Quarantelli and Dynes 1977, Tierney 2007).

Disaster scholars have been slow to adopt perspectives on gender, class and race, the effects of which were viscerally demonstrated post Hurricane Katrina in 2005 (Hartman and Squires 2006, Tierney 2007). These perspectives are becoming increasingly significant and will likely continue to grow in importance given the increase in the severity and frequency of disasters and the further internationalisation of emergency management (Leaning 2013, Lewis, Phillip and Westgate 1976, Wilson and Gosiewska 2014). However, disaster research is young so it has potential for growth but to develop the field must engage with broader theoretical domains such as risk, institutions, societal-environment interactions and organisations (Tierney 2007). Accordingly, this study is located within the organisations domain.

2.4.11 Command and Control: an Organisations Theory Perspective

Organigrams 1 and 2 outline structures that can be defined as organisations, though this concept is perhaps more of a general notion than comprehensively understood (Bratain 2014, Clegg and Hardy 1999). Organisations theory is a disparate field used to develop and enhance knowledge though a collection of loosely knit themes, ideas and methods, which have

developed over time (Ashkanasy, Wilderom and Petersen 2011). Historically the field contains 2 broadly accepted perspectives, mechanistic and organic (Chang 2015). Fordist manufacturing processes informs the traditional mechanistic view, and the (biological) organic perspective considers an organisation as a living entity (Bratain 2014, Morgan 2007). Critiques of Command and Control advocate decentralised, collaborative approaches, whilst questioning the model's appropriateness in the face of disaster, are perhaps more aligned with the organic view (Curnin and Owen 2014, Dynes 1970, Dynes 1994, McAleavy 2010, Neal and Philips 1995, Quarantelli 2002, Quarantelli 2006, Swope and Patton 2005, Waugh and Streib 2006). Whereas, practitioner views that advocate Weberian hierarchies and centralisation, and focus on systemic enhancements are arguably mechanistic in their outlook (Bearman et al. 2015, Breimyer 2011, Cole 2000, Davis 2005, H.M. Government 2013c, Schneider 1992).

- **Key Point 22: Perspectives on Command and Control are divergent: academic critiques are more organic whereas practitioners are mechanistic**

2.4.11.1 Culture

Culture is a key aspect of organisations theory: its study is influential in business and management research as well as within emergency management (Alvesson 2002). Culture relates to how people think, it concerns feelings, values and actions, and is guided by notions, ideas, meanings and beliefs (Alvesson 2002). Schein (2010) (p18) defines culture as *"a pattern of shared basic assumptions learned by a group as it solves its problems of external adaptation and internal integration"*. The impact of culture research is such that during the 1980s it was considered as one of the defining aspects of a number of high performing US and Japanese businesses (Alvesson 2002). Broadly speaking, the literature can be divided into 2 sub-domains, namely organisational culture, and culture and performance (Hofstede et al. 1990, Xiaoming and Junchen 2012). See Xiaoming and Junchen (2012) for a comprehensive review of this literature as this is considered beyond the scope of this chapter.

Culture can be learnt, it can be overtly taught, or it may simply be *"picked-up"* by being there. It is a pattern or system of integration and in many ways it can be a method of simply fitting in (Schein 2010). Consequently, an organisation may have an overt or formal culture and a number of informal sub-cultures which can be integrated (harmonious), differentiated (conflict) or fragmented (flux), which can lead to the formation of norms and values that are at cross purposes resulting in varying levels of performance (Hofstede 1998, Martin 1992, Schein 1994, Schein 2010).

Disasters as social entities involve numerous organisations meaning culture is highly pertinent to this study (Dombrowsky 1998, Neal and Webb 2006). On a practical level deployed emergency responders must understand cultural differences to avoid misinterpretation and conflict (Diversity Preparedness - Drexel University 2015, Solis, Hightower and Kawaguchi

1997). The *"Pollock Report"* (2013), which reviewed persistent lessons not being learned by UK practitioners since 1986 cited cultural factors 30 times, this included the absence of a no blame culture and the need for cultural changes around safety. In the US there is a well-known cultural rivalry between the New York Police and Fire Departments, which is often dismissed as organisational pride and rivalry. However, the 9/11 Commission Report concluded this dynamic cost lives on the day, which highlights the importance of culture within emergency response (9/11 Commission 2004, Adwar 2014).

Disasters are inherently multi-agency, so ideally emergency management necessitates a whole community approach, particularly at the *"catastrophic"* level, which brings together numerous cultures, which if not managed appropriately may compromise the response (Kapucu 2015, Quarantelli 2006). The New York inter-service rivalry has resulted in compromised routine emergency and disaster responses (Adwar 2014). Research has also shown that cultures of racism and gender discrimination have afflicted emergency services worldwide with Police services on both sides of the Atlantic having faced accusations of institutional racism (Dick and Nadin 2006, Evans 2015b, Heijes 2007, New York Post 2015, Souhami 2014). There is an increasing body of psychosocial research looking to combat the traditional macho-hard-drinking emergency services culture focused on reducing stress, critical-incident stress management and Post-Traumatic Stress Disorder (PTSD) treatment as high numbers of suicides still occur. Cultural factors mean practitioners with mental health problems do not readily seek help due to fear of ridicule (Gollom 2014, Gow and Paton 2008, O'Riordan 1992, Regel 2007).

Command and Control is also a culture. Military recruits are indoctrinated to respect the chain of command upon enlistment to ensure soldiers follow orders in battle (British Army 2015). Paramilitary emergency services adopt similar practices, though to a lesser degree (Wakefield and Fleming 2009). However, other emergency management organisations are very different and there are distinct cultural differences between the public and private sectors, which span the range of emergency responders, the former tend to be more collaborative, though this is not universal (Baaraspul 2009, Downe and Asworth 2013). This public/private sector cultural dynamic also raises an interesting question concerning the significance of profit (a key issue in the private sector) and where it ranks within the generic priorities of life, property and environment. These priorities are more culturally ingrained into emergency services that focus on life-saving every day, but perhaps not so in profit oriented businesses (H.M. Government 2014a, Sylves 2008). These factors when viewed through Tannenbaum and Schmidt's continuum (1973) indicate a range of organisational cultures are brought together within the temporal Command and Control framework (Dynes 1981). This has the potential to reduce interoperability unless a consensus is achieved, which is a paradox of the fundamental autocratic principles of Command and Control.

The UK Police Gold Commander role and the US Unified Command concept are attempts to alleviate this. However, interoperability is still hampered by multiple organisational cultures and goals, which has necessitated national policy initiatives such as JESIP, and the NIMS/ICS standardisation drive (Department of Homeland Security 2008, H.M. Government 2013c, Schaafstall, Johnston and Oser 2001). Though training is rather one-dimensional as it is *"heavily influenced by first-responder culture",* which impacts on the learning outcomes (Wilson 2013) (p 96). Despite development activities there remains an identifiable need for additional research as standardisation has yet to be achieved and may well be a *pipe-dream* (Drabek 1985, Jensen 2009) as the systems are culturally fragmented, which can inhibit emergency response operations. The dominant cultures within Command and Control reflect the principal (those organisations that hold power) within the frameworks, which are in turn an indication of how individuals see themselves (Yelegaonkar 2014). Dynes and Quarantelli (1975) found a range of behavioural styles in local response ranging across Tannenbaum and Schmidt's continuum, which validates this point (Drabek 1985, Tannenbaum and Schmidt 1973). Indeed, no specific personality type is yet associated with effective command, which questions the current standardisation agenda (Groenendaal and Helsloot 2015).

- **Key Point 23: The UK and US Command and Control frameworks contain a range of dissimilar organisational cultures, which are not always harmonious**

2.4.11.2 Identity

The development of an individual's identity is something that takes places over a lifetime, requiring the building blocks of continuity, uniqueness, and the establishment of affiliations to separate one's self from others to establish a sense of individuality (Cote and Levine 2002). Defining identity is a complex task beyond the scope of this study and a comprehensive definition has so far eluded the field (Waterman 1988). This section will focus on the 2 dominant themes within the relevant literature: identity theory, which is concerned with *"what one does"* and social identity theory, which bases identify formation on *"who one is"* (Cote and Levine 2002).

Within identity theory there are 2 key perspectives: firstly, Erikson's Psychosocial Development theory, which was influenced by Freud's structure and topography of personality (Burke and Stets 1998). Within the theory, a person seeks a stable identity experientially through identity versus role confusion in social and occupational settings during 8 life-stages from childhood to adulthood (Elkind N.D., McLeod 2013, Palombo, Bendicsen and Kock 2009, Svetlina 2014). The second key perspective is Marcia's Identity Status theory in which identity is the combined outcome of a person's exploration (experimentation with directions and beliefs), commitment (decisions on path taken) and making of a firm commitment to a status (Ickes, Park and Johnson 2012).

At first glance the notions of what one does and who one is may seem similar, but on closer inspection they are markedly different. The author, upon joining H.M. Coastguard in 2002 was informed *"once a coastguard always a coastguard"* and was indoctrinated with a view of the service as part of who you are rather than just what you did. From this perspective it can be argued that for many practitioners their careers are more than just a job, they are dedicated to their profession and it is a way of life. For some, a job is a job; a means to an end and a way to pay the bills so emergency management is what they do rather than who they are. Indeed, many practitioners are drawn to their careers for the team bonds that establish a strong identity through a joint cause; a higher purpose and camaraderie, and sometimes a uniform or badge which is part of the identity formation process (McLeod 2013).

Research suggests Command and Control works better in single service environments (Bigley and Roberts 2001, Cole 2000, Jensen 2009). Identity contributes to this effectiveness as it binds personnel as collective identify amongst responders is developed through extensive training and indoctrination. This helps to engender unit cohesion and is a key-trait of high-performance teams (Molnau N.D.). Where it is less effective is *"disasters"* and *"catastrophes"* where far more organisations respond (Quarantelli 2006), more identities are brought together under extreme stress and may or may not be compatible with the roles stated in the pre-defined command structure. Key organisations such as the Police, Fire and Ambulance services recruit personnel, they undergo basic training, which forms their organisational identity (and culture), and they can often amass years of in-service experience before undertaking a command role in the multi-agency disaster response sense though, liaison and multi-agency working takes place day-to-day. In the UK, multi-agency command training is a relatively new evolution as much of the training is conducted in-house. However, the new multi-agency training primarily focuses on the needs of the host organisation (College of Policing 2015a, Fire Service College 2010). Other organisations such as local government, the voluntary and private sectors do not have such formalised career progressions, and it is far more common for personnel to switch between sectors and roles within their career meaning should they be deployed they may well have remnants of multiple identities and organisational cultures (Meister 2015). Thus, multi-agency culture and identity are secondary to a commander's principal organisational culture, identity and expertise, which have the potential to disrupt Command and Control interoperability (Ford and Schmidt 2000).

- **Key Point 24: Multi-agency culture and identity formation are secondary to a commander's principal organisational culture and identify**

Social identity theory was developed by Tajfel and Turner in 1979 to understand intergroup discrimination, specifically why in-group members tend favour their own (Capozza 2000). Within this perspective an individual does not have one identity rather they have several, and how they act, feel and think is largely dictated by social circumstances so family, friends and

colleagues may all see different identities that are true, but they are not necessarily the same (University of Twente 2010). Social identity is drawn from perceived group membership and is essentially an *"us"* conceptualisation that defines who one is, rather than what one does (Cote and Levine 2002, University of Twente 2010). When group members categorise themselves they tend to favour other members and seek positive self-esteem by differentiating non-members, forming their identity in terms of we as opposed to *"I"* (Tajfel 2010, University of Twente 2010, Worschel and Austin 1986). This phenomenon has manifested within the emergency management community with both positive and negative outcomes.

The emergency management community often enjoys a sense of camaraderie and *esprit de corps*; they can be close-knit communities that often pull-together in crises (Charman 2013, Marsar 2013). However, there have been scandals, cover-ups and cases of officers protecting their own, such as the Hillsborough football stadium disaster, and reports of bullying, intimidation, clique-formation and nepotism (Barnett 2015, British Broadcasting Corporation 2012b, Browder 2012, Gallagher 2015). Indeed, Michael Brown, FEMA Administrator during Hurricane Katrina refused volunteer fire fighters permission to deploy into Louisiana, as they weren't *"us".* Instead, preferring to deploy 1,000 DHS personnel under his command that would take 48 hours to mobilise illustrating the relevance of social identity theory, and need for responders to be part of the response social network (Waugh 2006).

2.4.11.2.1 Social Network Analysis

Social Network Analysis (SNA) is becoming increasingly important in disaster research as a tool that can be used to identify *"us"* and *"them"* (Kapucu, Yuldahsev and Arslan 2010). Magsino (2009) (p16) defines a social network as *"the interactions between people and organizations, including who knows, works with, or communicates with who, that can be mapped".* Freeman (2004) cited in McCulloh, Armstrong and Johnson (2013) (p31), provides a more in-depth perspective, suggesting the approach *"is grounded in the intuitive notion that the patterning of social ties in which actors are embedded has important consequences for those actors. Network analysts then seek to uncover various kinds of patterns and try to determine the conditions under which those patterns arise and to discover their consequences".*

SNA indicates that Command and Control is a closed shop as in the UK the CCA - Part 1 categorises organisations (see Fig 2.20), which effectively legislates the social network that is empowered to plan for and respond to emergencies (H.M. Government 2004b). It is what can be termed a *professionalised* model based on organisational relationships and cooperation, however from a more cynical SNA perspective it dictates who can and more importantly who (by omission) cannot respond (McEntire 2007, McEntire 2015, O'Leary and Blomgren-Bingham 2009). The US adopts a more open whole community approach, though the extent of this engagement likely differs across the country (Federal Emergency Management Agency 2014m, Kapucu 2015). This could inadvertently promote a *consumer-culture* whereby the public simply

expect designated organisations to meet their emergency management needs advocating the public do nothing to help themselves. Extensive disaster sociology research indicates the public are not passive and generally act pro-socially when disaster strikes so at a philosophical level Command and Control contradicts a significant body of disaster research (Auf der Heide 2004, Carr and Jensen 2015, Dynes, De Marchi and Pelanda 1987, Dynes 1994, Fischer 2003, Kreps 1984, Perry and Lindell 2003, Rodriguez, Trainor and Quarantelli 2006, Stallings and Quarantelli 1985, Tierney 1998, Tierney and Trainor 2004, Tierney, Bevc and Kuligowski 2006). In catastrophe it is idealistic to expect *"us"* (those responders in the social network) to be able to seek authorisation, and it is stupid to expect *"them"* (those not in the social network) to do the same, as they are not authorised to do so. Furthermore, pro-social actively is often framed as anti-social behaviour, which may also limit the public's inclination towards self-help (Tierney, Bevc and Kuligowski 2006). SNA demonstrates that Command and Control actually inhibits the community's propensity and ability to prepare for and respond to disaster. A defence of this based on Police crime scene protection, Fire service cordon health and safety and Ambulance service privacy of patient's rights can be made as these services do not want the *"chaos"* of untrained personnel getting in the way. However, this is excusable when it may ultimately cost further lives as valuable human and material resources are left unused.

2.4.11.3 Metaphor

"All the world is a stage, and all the men and women merely players, they have their exits and their entrances"
(William Shakespeare)

Metaphor is a staple of organisations research, and involves the mapping of entities, structures and relations from a source domain on to a target domain to enable a deeper conceptual understanding by making the unfamiliar become familiar (Cornelissen and Kafouros 2008a, Lakoff and Johnson 2003, Morgan 2007). Metaphor is a way of thinking and seeing, it informs our world view; it influences science, language and day-to-day expression as it is a process of understanding one element of experience in terms of another through implicit assertions that A is like B that moves beyond the literal, for example *"the man is a lion"* (Morgan 2007). Shakespeare's quote cited above provides an interesting though abstract metaphor of disaster management, which illustrates the ability of metaphor to convey deeper meaning beyond the literal. *"All the world is a stage"*, the disaster is the world and the stage is the Command and Control framework, and *"all the men and women merely players"* refers to the survivors and the responders and, *"they have their exits and their entrances"* emergency responders have their jobs and a finite timescale in which to do them.

Metaphor is considered as one of the primary means by which academics conceptualise organisations (Cornelissen and Kafouros 2008a). Metaphor is becoming increasingly valuable as an imagery tool to simplify complexity within organisations through a non-literal descriptive

process to understand real situations in deeper and more meaningful ways (Morgan 2007, Renz 2009). Morgan's (2007) 8 organisational metaphors, see Fig 2.17, are a valuable analytical tool and are perhaps the most influential organisational metaphor theory to date (Grant and Oswick 1996, Lang 2008, Morgan 2007). The contribution of metaphor to organisations theory is widely acknowledged, though questions remain as to the precise impact of metaphors on actual theoretical understanding and the specific impact of particular metaphors (Alvesson 1993, Cornelissen and Kafouros 2008a).

Research using organisational metaphor is active and a chronological account of all research is beyond the remit of this study. Rather, an indication of the thematic breadth of current research within this sub-domain of organisations theory is provided to illustrate the current state of the art.

Hausmann-Muela and Eckl's (2015) research on malaria prevention discusses the metaphorical framing of the disease as a biotechnological issue rather than one of social deprivation. The policy implications of the metaphor switch are significant potentially diverting strategic emphasis and funding away from developing vulnerable countries towards investment in biotechnology research, which illustrates the power of organisational metaphor in policy development. Christensen and Cornelissen (2015) combine myth and metaphor to understand organisational transparency, which is a key focus for private as well public and voluntary sector organisations (Bennis, Goleman and O'Toole 2008). Indeed, within emergency management the need for organisational transparency is paramount when lives may be lost and public inquiries may result from actions taken or not taken. Christensen and Cornelissen (2015) frame organisational transparency using metaphors of openness and information and proactive disclosure, communicating passive and active images which highlight the method's ability to convey differing interpretations of the same concept.

McAllister et al (2015) eloquently liken the political skill needed to thrive in organisational life to a game of chess. This resonates closely with the hyper-political Command and Control environment that typifies most post disaster scenarios, where best and self-interests can collide; individuals and organisations play the game rather than pursue the greater good (Sylves 2008). Nisula et al (2015) use playfulness as a metaphor for team creativity and innovativeness, which has application within emergency management. Creativity and flexibility amongst emergency responders is frequently posited as a solution to criticisms of Command and Control (McEntire et al. 2013, Webb 2014). Thus, Nisula et al's (2015) playfulness metaphor has potential as a training tool to promote these qualities and encourage greater decentralisation (Drabek and McEntire 2002, Jensen 2009, Perry 2003, Tierney and Trainor 2004, Waugh 1994). The *"symbol of the commander in chief is so strong that the scientific insights gain no ground with practitioners"* so innovative methods to link theory to practice are much needed (Helsloot 2008a) (p 174).

Metaphor pervades business, economics, finance, management, training, health, education and organisational development research. Indeed, disaster is frequently represented using the metaphor of war; but, little evidence of broader metaphor research in emergency management (beyond the medical sector) has been found (Craven, Hollis and Richardson 2011, Docherty 2001). This indicates there is a significant research gap to harness the communicative power of metaphor to gain a deeper and richer insight into practitioners' views of Command and Control beyond mere description.

2.4.11.3.1 Morgan's Organisational Metaphors

Morgan's (2007) 8 metaphors, outlined in Fig 2.17 below, provide a framework to map similarities and differences in interpretations of Command and Control forming the basis of a systematic study using linguistic and visual metaphor.

Fig 2-17: Morgan's (2007) **Organisational Metaphors**	
Metaphor	**Criteria**
1. **Machine**	Efficiency, waste, maintenance, order, clockwork, cogs in a wheel, programmes, inputs and outputs, standardisation, production, measurement and control, design
2. Organism	Living systems, environmental conditions, adaptation, life cycles, recycling, needs, homeostasis, evolution, survival of the fittest, health, illness
3. Brain	Learning, parallel information processing, distributed control, mind-sets, intelligence, feedback, requisite variety, knowledge, networks
4. Culture	Society, values, beliefs, laws, ideology, rituals, diversity, traditions, history, service, shared vision and mission, understanding, qualities, families
5. Political system	**I**nterests and rights, power, hidden agendas and back room deals, authority, alliances, party-line, censorship, gatekeepers, leaders, conflict management
6. Psychic prison	Conscious & unconscious processes, repression & regression, ego, denial, projection, coping & defence mechanisms, pain & pleasure principle, dysfunction, workaholis
7. Flux & transformation	Constant change, dynamic equilibrium, flow, self-organisation, systemic wisdom, attractors, chaos,

	complexity, butterfly effect, emergent properties, dialectics, paradox
8. Instrument of domination	Alienation, repression, imposing values, compliance, charisma, maintenance of power, force, exploitation, divide and rule, discrimination, corporate interest
Adapted from: (Lawley 2001, Morgan 2007, Oates and Fitzgerald 2007)	

- **Key Point 25: It has been argued that all we know about organisations is drawn from Morgan's** (2007) **metaphors**

2.4.12 Defining the Selected Theoretical Lenses

The two initial theoretical lenses, identity and culture are linked by the third, metaphor, which is the primary theoretical domain underpinning this study. Culture and identity are metaphors as they capture important features of Command and Control in that stakeholders display identity and cultural traits related to any given organisation, which is established on the premise that identities and cultures can be ascribed to organisations as well as people (Gioia, Schultz and Corley 2000, Whetten and Mackey 2002). It is metaphor that provides the thread that binds these 3 domains together. Herein is the crux of the rationale, much of our knowledge of organisations is rooted in Morgan's 8 metaphors (Grant and Oswick 1996, Lang 2008, Morgan 2007). Thus, as Command and Control is a social rather than a physical entity, metaphor can be used to make it more intelligible and understandable through the richness of practitioners' own language and imagery to enhance knowledge and interoperability in preparedness for future disasters (Barter 2011, Cornelissen and Kafouros 2008b).

2.5 The Policy and Practice of Command and Control

2.5.1 Emergency Management in the United Kingdom (UK)

O'Brien and Read (2005) argue the aftermath of World War II was pivotal in the evolution of UK emergency management. The legislative combination of the Civil Defence Act (1948) (H.M. Government 1948), which set out procedures for the public to protect themselves in the event of a nuclear attack and the Emergency Powers Act (1920) amended (1964), which gave the sovereign power the ability to declare a state of emergency in certain circumstances, coupled with the UK Central Government's willingness to let local organisations deal with emergencies, ensured that UK emergency management evolved in a complex but localised manner (Kapucu 2010, Sahin, Kapucu and Unlu 2008). Hills (1994) (p 66) stated *"there has never been one man or one organisation charged with managing the national response to disasters in the UK",* which illustrates the primacy of local responders and the devolved but intrinsically multi-agency nature of UK emergency management (Rockett 1994). Successive governments maintained that control must be exercised locally, although no statutory duty to respond collectively or to

cooperate and coordinate local efforts existed (Cabinet Office 2004, Kapucu 2010). Though, it was understood that external assistance may be needed, the responsibility to plan for and deal with disaster remained a local responsibility (Hills 1994, Kapucu 2010, Rockett 1994). This approach of central and local responsibilities remained the hallmark of UK emergency management up to the 1980s, when the Civil Defence in Peacetime Act (1986) recognised the end of the Cold War and effectively legislated for the system that was in place (Hills 1994, Kapucu 2010).

In the late 1980s, a number of civilian disasters including the Kings Cross fire (1987), the Zeebrugge ferry capsize (1987), the Clapham rail crash (1988) and the, Hillsborough Football Stadium crush (1989) pushed a review of emergency management up the political agenda (O'Brien and Read 2005). The subsequent Home Office reviews in 1989 and 1991 concluded there was no need for change (Hills 1994, Kapucu 2010, O'Brien and Read 2005). Consequently, the existing system remained in place up to the end of the last millennium (Kapucu 2010, O'Brien and Read 2005, Smith 2003).

Disasters, or rather the experience of such events, often act as a catalyst providing the impetus for change (Alexander 2002b, Olofsson 2007). Although, the UK disasters of the 1980s did not lead to legislative change at the time, it may be argued these events *"sowed the seeds"* for future change. Arguably, without the disasters of the 1980s the current UK legislation in the form of the Civil Contingencies Act (2004) may well have evolved differently or indeed not at all (H.M. Government 2004a, H.M. Government 2004b). Due to the relatively limited scope and scale of these incidents the resultant UK conceptualisation of disaster does not reflect the global or indeed academic understanding of the term (Bissell 2013, Perry and Quarantelli 2005b). However, it was events early in the new millennium that would prove to be the catalyst for change.

At the turn of the 21st century memories of Chernobyl, Hillsborough, King's Cross and Zeebrugge etc still lingered in the collective UK psyche. Whilst, the increasingly global reach of modern media ensured that international disasters, such as the 1994 Rwandan genocide (United Human Rights Council 2014) and the 1995 Kobe earthquake (Tierney and Goltz 1997), events that would once have been remote and seemingly distant were brought into the homes of millions of Britons (Moore 1994). It was against this backdrop of an increasingly disaster-aware British public that the Millennium Bug fiasco occurred, highlighting the Central Government's inability to respond quickly to disaster (O'Brien 2007). The Millennium Bug, (O'Brien 2006) (p 67) in particular demonstrated to the UK Central Government that it could not direct action at a local level, with many government departments feeling constrained because they lacked formal powers to require information or action (Beckett 2000, O'Brien 2006). The fuel crisis and autumnal floods of 2000, and Foot and Mouth outbreak in 2001 enhanced this

belief, propelling the UK Central Government into action (H.M. Government 2004a, H.M. Government 2004b, Kapucu 2010, O'Brien and Read 2005).

A review commenced in early 2001, which resulted in lead responsibility transferring to the new Civil Contingencies Secretariat (CCS) (Kapucu 2010, O'Brien 2006, O'Brien 2007). This process included a public consultation exercise, which reinforced Central Government's conclusion that legislation of the time no longer provided an adequate framework, and new legislation was needed (O'Brien 2006, Smith 2003), though it is worth noting that Civil Servants rather than practitioners or academics made these policy decisions. Following public consultation on the draft Bill and pre-legislative scrutiny by a Joint Parliamentary Committee, the Civil Contingencies Bill was introduced to Parliament on 7th January 2004 and received Royal Assent on 18th November 2004 (H.M. Government 2004b). Hence forth, it became known as the Civil Contingencies Act 2004 and the CCA herein.

- **Key Point 26: UK governmental failures in the late 1990s early 2000s triggered legislative change, resulting in the passing of the CCA in 2004**

2.5.2 The Civil Contingencies Act 2004 (CCA)

The CCA was heralded a new beginning for UK Emergency Management as it sought to establish an effective framework for anticipating and responding to a range of threats, whilst reforming the out-dated civil defence legislation that was focused on a nuclear attack (O'Brien 2006). Essentially an overhaul of the Emergency Powers Act (1920) amended (1964), the Civil Defence Act (1948), and the Civil Defence in Peacetime Act (1986) (H.M. Government 1920, H.M. Government 1948, H.M. Government 1964, H.M. Government 1986). The CCA and the accompanying regulations and non-legislative measures, were designed to deliver a single framework for emergency management in the UK capable of meeting the challenge of the 21st century. However, despite these lofty aspirations the CCA has been criticised as it seemingly legislated for the existing system rather than altering existing practice at a fundamental level as many had hoped (Kapucu 2010, O'Brien and Read 2005, O'Brien 2006, O'Brien 2007).

2.5.2.1 Definition of an Emergency

A key aspect of this modernisation was the redefining of "*emergency"* in order to expand the remit of local emergency responders (H.M. Government 2004a). The CCA defines *"emergency"* as *"an event or situation, which threatens serious damage to human welfare in a place in the UK, the environment of a place in the UK, or the security of the UK or of a place in the UK,"* (Anderson and Adey 2012, Civil Contingencies Secretariat 2013). Before the CCA (2004), the Emergency Powers Act (1920) defined *"emergency"* as *"interference with specified services and resources which will deprive the community of the essentials of life";* the Civil Defence Act (1948) defined it as a *"hostile attack"*. The Civil Defence in Peacetime Act (1986)

indicates a shift in the meaning of *"emergency"* to denote crises arising from both natural disasters and civil emergencies, which is an important policy development signifying an expansion in the practical conceptualisation of the term *"emergency"* (O'Brien 2006). Consequently, the review concluded the list of services and resources was out-dated and unsuitable in the modern world, and the focus on essential services and resources did not accurately reflect 21st century threats (H.M. Government 2004a, O'Brien 2006, O'Brien 2007). The purpose of redefining *"emergency"* was to expand the remit of responders beyond the singular threat of nuclear attack to meet the broader-array of risks facing the UK as detailed in the National Risk Register (NRR): (Cabinet Office 2015). However, as discussed earlier the current definition is limited, as it ignores and indeed contravenes over 50 years of research, though it fulfils its policy role as a trigger mechanism. It can be argued whilst trying to move away from a singular-focus that UK emergency management has, perhaps inadvertently, refocused itself on another specific threat as a result of the 9/11 terrorist attacks in the US (O'Brien 2006, O'Brien 2007).

2.5.2.2 Overview of the CCA (2004)

The CCA is the capstone of UK emergency management underpinning all emergency preparedness, response and recovery activities. For the first time the legislation allocated certain duties to those organisations categorised as responders and established a framework with national, regional and local tiers. However, this arguably legislated for the informal structure that was in place prior, whilst also drawing in additional organisations into the multi-agency environment (Dillon 2014, O'Brien 2006). Please note the UK Conservative government abolished the regional tier of government in 2011, rationalising the UK governance framework into tiers in a move the Communities Secretary Eric Pickles claimed brought to an end *"the Command and Control apparatus of England's over-centralised state"* (Cooper 2011, Sandford 2013). The CCA comprises 2 substantive parts, with a third general administrative component summarised in Fig 2.18 (H.M. Government 2004a, H.M. Government 2004b).

Fig 2-18: Components of the CCA (2004)
• **Part 1 – Local Arrangements:** focuses on local arrangements for emergency management, establishing a statutory framework of roles and responsibilities for local responders (H.M. Government 2004c).
• **Part 2 – Emergency Powers:** focuses on emergency powers, establishing a modern framework for the use of special legislative measures that might be necessary to deal with the effects of the most serious emergencies (H.M. Government 2004d).
• **Part 3 – General:** contains the mechanisms for minor and consequential amendments and repeals, details of the monies to be provided by Parliament, and provisions for the commencement of the *"Act"* (H.M. Government 2004e).

Despite being heralded as a *new beginning* it can be argued the CCA was not entirely new at all (O'Brien 2006, O'Brien 2007) but instead simply formalised and codified existing structures and practice, establishing legal duties for the first time (Dillon 2014, O'Brien and Read 2005). Though, still retaining the guiding principle of Central Government's role of advisor and co-ordinator with local organisations responsible for filling the details of operational planning and managing incidents on the ground (Smith 2003). As such, the CCA was perhaps more of an enhancement rather than a *new-dawn*.

The following section details parts 1 and 2 of the CCA only as Part 3 is the administrative component, which is not relevant. Discussion of these elements is necessary to contextualise UK emergency management and to demonstrate the central role Command and Control plays within it.

2.5.3 The CCA (2004) – Part 1: Local Arrangements

Part 1 updates the definition of *"emergency".* It establishes a clear set of responder roles and responsibilities for the first time in order to afford greater structure and consistency to civil protection activities, whilst also establishing a sound basis for performance management at a local level (H.M. Government 2004a). A key aspect of the legislation is the statutory civil protection duties, summarised in Fig 2.19, which legally obligates those organisations categorised as having a role in emergency management to adhere to (H.M. Government 2013d).

The 7 duties adopt a risk-based approach to emergency management, predicated on the effective identification and assessment of hazards (Coppola 2006). This is arguably the dominant approach prevalent to Western emergency management, enshrined in UK law by the CCA (Federal Emergency Management Agency 1996, Public Safety Canada 2011). The alternate vulnerabilities approach focuses on identifying and mitigating vulnerabilities within societies and is prevalent in the developing world is seemingly beyond the legal scope of UK emergency management, despite its increasing relevance to the emerging community resilience work-stream (Enarson 2007, H.M. Government 2011a).

- **Key Point 27: The CCA effectively legislates for the risk-based approach in UK emergency management**

Fig 2-19: Civil Contingencies Act (2004) Statutory Duties	
No	**Duty**
1.	Risk Assessment
2.	Emergency Planning
3.	Business Continuity

4.	Public Warning and Informing
5.	Information sharing with other local responders
6.	Cooperation with other local responders
7.	Business Continuity Promotion (Local Government only)
Source: (H.M. Government 2004c)	

2.5.3.1 The UK's Emergency Responder Social Network

The CCA clearly defines Category 1 emergency responders who are *"likely to be at the core of the response to most emergencies and are subject to the full range of civil protection duties (1-7 above)";* (Civil Contingencies Secretariat 2013, Stainsby 2012). The CCA also defines Category 2 emergency responder organisations, who are *"less likely to be involved in the heart of multi-agency planning work, but will be heavily involved in preparing for incidents affecting their sectors"* (Stainsby 2012). These organisations are required to co-operate and share information (duties 5 and 6) with other categorised responders (Civil Contingencies Secretariat 2013, Stainsby 2012). It is interesting to note that in the early 2000s the UK Central Government felt it necessary to enact legislation that legally required emergency responders to both co-operate and to share information; this begs the question whether this should not already be happening and if not then why not? More recently, between September and October 2015 H.M. Government undertook consultation on proposals to enable closer working between the Police, Fire and Ambulance services in England, highlighting that services are still not cooperating effectively (H.M. Government 2016).

- **Key Point 28: The CCA defines the UK emergency management social network**

The CCA is underpinned by approximately 200 thematic guidance documents, which can be accessed via www.gov.uk. Arguably, the most important are the Emergency Preparedness and the Emergency Response and Recovery guidance documents (H.M. Government 2013b). Fig 2.20 outlines the UK's statutory and non-statutory emergency responder social network, which in turn forms the local Command and Control framework (Organigram 1). Whilst the CCA defines organisations as Category 1 and Category 2 emergency responders, the Emergency Response and Recovery guidance outlines what is termed the *"Wider Resilience Community"* (H.M. Government 2004c, H.M. Government 2013b). This loose definitional term refers to other entities that are deemed suitable to provide assistance during *"emergencies"*, see grey shaded area in Fig 2.20 below. The UK can be said to be operating a *professionalised* model whereby *"emergency"* response is generally considered the remit of professional responders or trained organisations. This term was coined by the author and denotes an approach that has elements of both the traditional and professional models being somewhere between the two (McEntire 2015, O'Leary and Blomgren-Bingham 2009) .

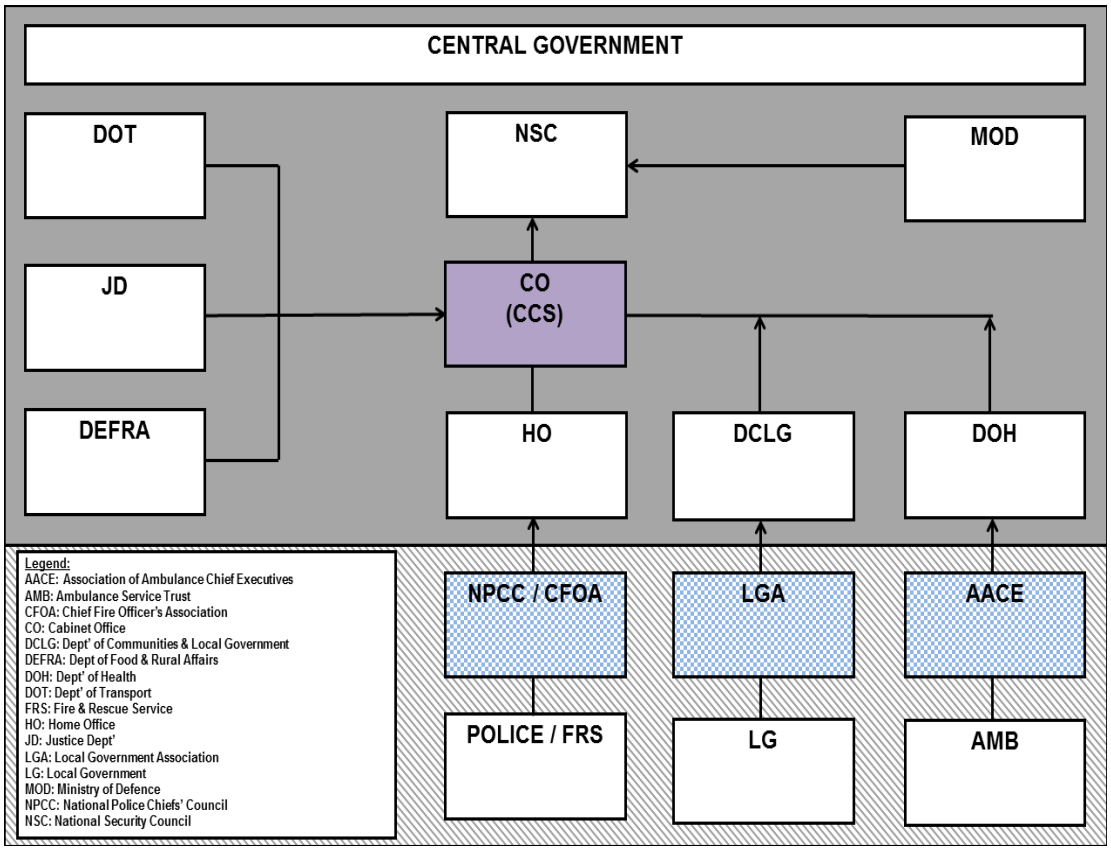
Fig 2-20: CCA (2004) Organisational Framework	
Category One (Core)	**Category Two (Key Cooperating)**
1. Police Services (including British Transport Police)	1. Utilities, Telecommunications and Transport Providers
2. Fire Authorities	2. Highways Agency
3. Ambulance Service Trusts	3. Health and Safety Executive
4. Acute & Foundation Trusts	**Wider Resilience Community (no statutory duties)**
5. Primary and Community Care Services	1. Lead Government Departments
6. National Health Service Clinical Commissioning Groups	2. Animal Health and Veterinary Laboratories Agency
7. National Health Service England	3. Department of Health
8. Public Health England	4. Other National Health Service Organisations and Providers
9. Public Health Wales	5. Public Health
10. Port Health Authorities	6. H.M. Coroner
11. Independent Healthcare Organisations	7. Civil Society (including voluntary sector and faith groups)
12. Maritime and Coastguard Agency	8. Armed Forces
13. Local Authorities	9. Search & Rescue (Ministry of Defence)
14. Environment Agency	10. Air Accident Investigation Branch
15. Natural Resources Wales	11. Rail Accident Investigation Branch
	12. Marine Accident Investigation Branch
	13. Other Private Sector Organisations
	14. The Community
	15. Civil Nuclear Arrangements

2.5.3.2 Governance of Emergency Management in the UK

Governance in emergency response is critical as clear roles and responsibilities can limit duplication of effort. Primacy in UK emergency management sits with local emergency responders, and successive reviews have concluded it is appropriate for Central Government to consider an advisory and co-ordination role (Rockett 1994, Smith 2003). This is contradictory as the policy outlined in *"Responding to Emergencies: the UK Central Government Response Concept of Arrangements (CONOPS)"* is predicated on increasing top-down centralisation in the most severe emergencies (H.M. Government 2013a). This is tantamount to saying *"you can deal with it most of the time, but we will take over at some point",* which opposes numerous authors who are critical of top-down approaches (Dynes 1983, Dynes 1993, Dynes 2000b, Jensen and Waugh 2014, Neal and Philips 1995, Tierney 2001, Waugh and Streib 2006, Wise and Nader 2002).

The governance of UK emergency management changed in the early 2000s, then again as a result of policies enactment by the incoming coalition government in 2010 (Bangham and Shah 2012, Cabinet Office 2014a, O'Brien and Read 2005). Responsibility transferred from the Home Office to the Cabinet Office in July 2001 following a series of mishandled *"emergencies"* and the findings of subsequent reviews (Sahin, Kapucu and Unlu 2008, Smith 2003). Within the Cabinet Office, responsibility was bestowed on the newly established Civil Contingencies Secretariat (CCS) (Kapucu 2010, O'Brien and Read 2005). The CCS is located within the heart of Central Government, working in partnership with other departments and the devolved administrations in Northern Ireland, Scotland and Wales to progress emergency management across the UK (United Nations 2014).

Fig 2-21: UK Emergency Management Governance Arrangements



Adapted from: (Ellwood and Philips 2013, H.M. Government 2015, H.M. Government 2016)

2.5.3.3 The UK's National Security Council

The UK National Security Strategy establishes a clear objective to ensure a secure and resilient UK by protecting *"people, the economy, infrastructure, territory and way of life from all major risks"* (H.M. Government 2010). The National Security Council was established by Prime Minister David Cameron on 12th May 2010 and is the *"main forum for collective discussion of the government's objectives for national security and about how best to deliver them in the current financial climate"* (Bangham and Shah 2012, Cabinet Office 2014a).

The Council meets weekly and is chaired by the Prime Minister; it currently has 3 ministerial sub-committees and is responsible for meeting the National Security objective (Cabinet Office 2014a). One sub-committee considers issues on threats, hazards, resilience and contingencies, and includes a restricted group for intelligence matters. A second sub-committee considers nuclear deterrence and security matters while the third is focused on international concerns. The sub-committees are supported by cross-government senior official groups that inform the ministerial level structures (Cabinet Office 2014a).

2.5.3.4 Ministerial Department Responsibilities

The CCS plays a key role in supporting the National Security Advisor, and is responsible for *"work to improve the UK's ability to prepare for, respond to and recover from "emergencies"* (Cabinet Office 2014a). In keeping with UK policy the CCS's adopts a risk-based approach focused on 4 key areas of risk assessment, preparation and planning, response and recovery and building a resilient society (Cabinet Office 2014a, H.M. Government 2012a). The legislation reforms also saw the introduction of the National Resilience Capabilities Programme designed to build the UK's capacity to deal with the consequences that are common to most types of *"emergency"* irrespective of the cause (Cabinet Office 2014b). The programme is broad-based encompassing 22 work-streams for which responsibility is assigned to a Lead Government Department (LGD) (Cabinet Office 2014b). However, the CCS manages the programme exercising effective hegemony, which O'Brien (2006) (p 72) argues is *"a centralised approach with Command and Control overtones"* whilst highlighting the *"considerable resonance"* between the functional work-streams and the modalities of a terrorist act", which in his view leaves *"little doubt that the UK government is focused on terrorism".* This policy shift from one threat to another rather than expansion suggests that actual UK all-hazards emergency preparedness is perhaps limited.

Key Point 29: The CCS's hegemonic role in UK Central Government has Command and Control overtones

2.5.3.5 Local Resilience in the UK

The UK Central Government established a clear duty on local emergency responders to create emergency plans, providing some ring-fenced resources to support these activities (Smith 2003). This local focus was at the heart of the *"Dealing with Disaster"* guidance (Cabinet Office 2004) and was retained and indeed strengthened by the CCA (H.M. Government 2004c). Initially, the CCA established a 3-tiered resilience structure consisting of the CCS at the heart providing guidance and support to localities via Regional Resilience Teams (RRT) that established multi-agency Regional Resilience Forums (RRF) in the now defunct regions (Brassett and Vaughan-Williams 2013, O'Brien 2006).

2.5.3.6 Local Resilience Forums (LRF)

At the local level the CCA established Local Resilience Forums (LRF), which bring together categorised local organisations to *"ensure the effective delivery of those duties under the CCA that need to be developed in a multi-agency environment and individually as a Category One responder"* (Cabinet Office 2013). LRF responsibilities are summarised in Fig 2.22:

Fig 2-22: LRF Responsibilities

1. Compilation of agreed risk profiles via a Community Risk Register (CRR)
2. A systematic, planned and coordinated approach to encourage Category One responders according to their functions, to address all aspects of policy in relation to:
    - Risk
    - Planning for “emergencies”
    - Planning for business continuity management
    - Publishing information about risk assessments and plans
    - Arrangements for Warning and Inform the public, and
    - Other aspects of civil protection duty, including the promotion of business continuity management by local authorities and,
    - Support for the preparation by all or some of its members of multi-agency plans and other documents, including protocols and agreements and the coordination of multi-agency exercises and other training events

Source: adapted from: (Cabinet Office 2013)

An LRF is coterminous with a Police service boundary area and provides the hub of local emergency management in the UK. All categorised emergency responders are legally required to participate within their LRF; however, there are a number of boundary mismatches across England and Wales (Cabinet Office 2013) due to the different numbers of Police, Fire and Ambulance services and Local Governments meaning a single LRF can be served by multiple organisations fulfilling the same role, albeit in a different geographic location. Indeed, in the case of Ambulance services and private sector companies a single organisation may be obliged to participate in multiple LRFs compounding the spatial mismatch (O'Brien and Read 2005).

Fig 2-23: Generic UK Local Resilience Framework

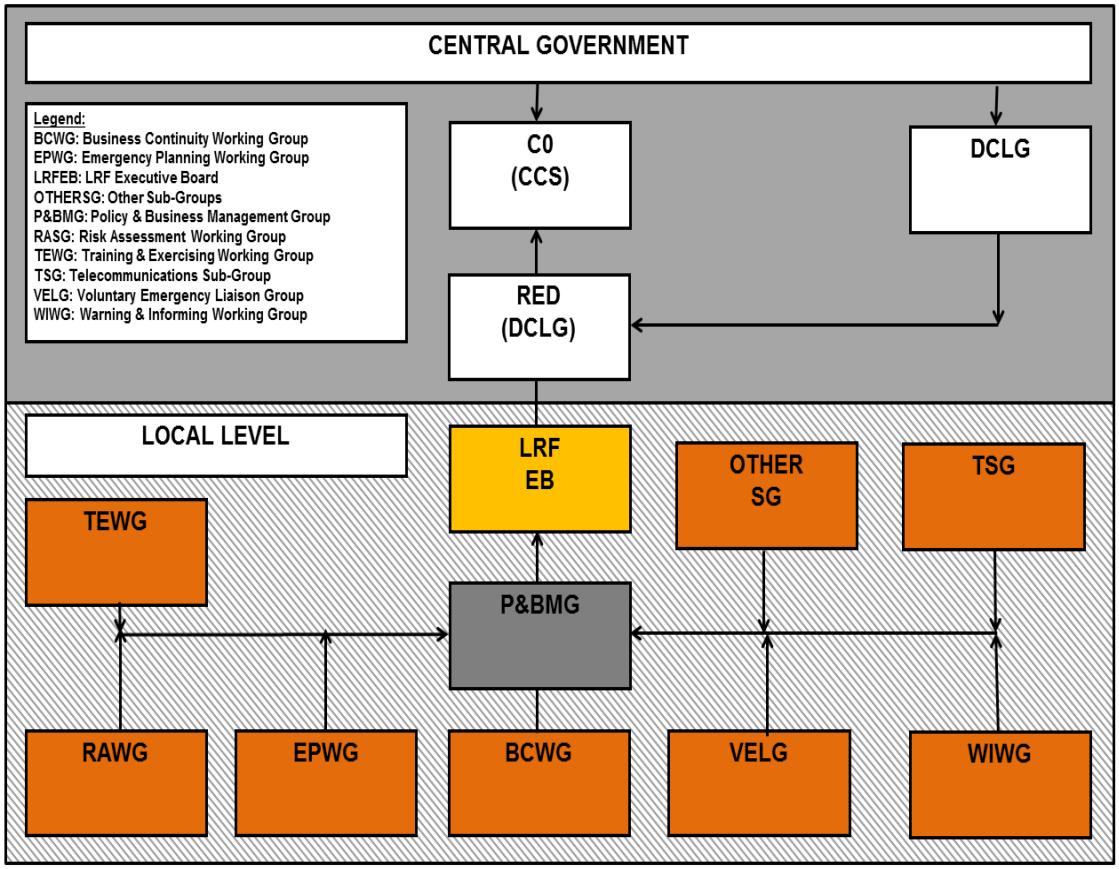


Fig 2.23 above outlines a generic LRF structure, the constitution and exact framework adopted is a local decision, and are focused on achieving the statutory duties through the application of risk-based methodology (Brassett and Vaughan-Williams 2013, H.M. Government 2004c, H.M. Government 2012a, Kapucu 2010). Generally, most LRFs operate an executive level board often simply named Local Resilience Forum; this consists of executive officers and representatives from the categorised organisations, responsible for setting the strategic direction of the LRF (Cumbria Resilience 2013, Humber Emergency Planning Service N.D.). This group is often supported by a Policy and Business Management Group (P&BMG), which is usually formed of middle-management representatives, often Emergency Planners or Resilience Officers. This group manages the day-to-day business of the organisation, and increasingly LRFs are appointing Secretariat Managers on either a full or part-time basis to ensure effective administration and management (H.M. Government 2014b, Local Resilience Forum Gloucestershire 2013).

The general emergency management work of the LRF is achieved through collaboration within various thematic sub-groups loosely arranged around the statutory duties of the Act. Also, it is common for hazard and risk specific groups called Task and Finish Groups to stand-up and down as threats emerge and subside, and as new priorities arise (Northumbria Local Resilience Forum 2012). Emergency plans, procedures and protocols are developed by members of the

sub-groups submitted to the P&BMG for approval, then forwarded to the LRF Executive Board for sign-off and dissemination (Cumbria Resilience 2013, Local Resilience Forum Gloucestershire 2013, Northumbria Local Resilience Forum 2012).

There are currently 42 standing LRFs within England (Cabinet Office 2013). In Scotland there are Strategic Coordinating Groups (SGC), working under the Resilience Advisory Board for Scotland (RABS) (Ready Scotland N.D.). In Wales there are 4 LRFs working under the Wales Resilience Forum (Wales Resilience N.D.). In Northern Ireland, as the CCA (2004) statutory duties apply only to a limited number of organisations, the LRF requirements do not apply but instead the province has its own *"Northern Ireland Framework for Civil Contingencies"* (Cabinet Office 2013, Dillon 2014, Office of the First Minister and Deputy First Minister 2005). Thus, there is not a standardised approach as initially envisioned by the Act.

Despite the centrality and importance of LRFs these bodies have no statutory powers to direct their members: no one individual is in charge rather they are collective partnerships that rely heavily on positive working relationships amongst multi-agency partners which is no easy challenge (Braithwaite 2013), cited in Brassett and Vaughn-Williams (2013) (p 234). This lack of statutory authority has led to concern regarding accountability; consequently there is extensive debate as to whether or not LRFs should be given legal status and powers to direct members (Cabinet Office 2011a, Devon, Cornwall, Isles of Scilly Local Resilience Forum N.D., Northumbria Local Resilience Forum 2012). This consideration was a significant component of the CCA Enhancement Programme (CCAEP), which launched in 20008, and was designed to assess whether the legislation was meeting the original intent, reflect best practice and develop modifications (Cabinet Office 2009, Cabinet Office 2011a, Cabinet Office 2011b).

An LRF is primarily focused on developing competence and capability prior to an *"emergency"*, i.e. it is a day-to day mechanism. The LRF transitions to what is known as a *"Strategic Coordination Group (SCG)"* or Gold Command (Brassett and Vaughan-Williams 2013) when an emergency occurs and will normally be chaired by a Police Gold Commander and comprises of senior representatives with executive authority from local organisations (Kapucu 2010). The SCG is the highest level of authority within the GSB framework, and is supported by Tactical Coordinating Group(s) (TCG) sometimes called Silver Command(s) and Operational Command(s), sometimes referred to as Bronze Command(s) (H.M. Government 2004c, Leicester, Leicestershire and Rutland Local Resilience Forum 2010, National Police Improvement Agency 2009a). This Command and Control framework is embedded within the day-to-day UK local resilience framework, which is illustrated by the Gold, Silver and Bronze colour-coding in Fig 2.23.

- **Key Point 30: Command and Control is a UK statutory requirement embedded within emergency management structures**

The LRF is essentially a social network, whether inadvertent or deliberate it bars participation as engagement is by invitation only. Gatekeepers grant access, as the public cannot attend LRF meetings: indeed academics with relevant expertise cannot attend without authorisation. Only authorised specialists and those of certain rank from categorised responders and invited organisations participate, which arguably limits the development of broad-based resilience (Shepherd and van Vuuren 2014, University of Twente 2015).

2.5.4 The CCA (2004) – Part 2: Emergency Powers

Part 2 of the CCA was intended as an update of earlier legislation, *"to reflect the developments in the intervening years and the current and the future risk profile"* (Lancashire County Council 2014). They can be applied nationally or within a devolved administration or region, and cover powers that may be needed to manage the effects of the most serious of *"emergencies"* (O'Brien 2006, Stainsby 2012), which enables the passing of temporary legislation, which must prevent, control, or mitigate an aspect or effect of the *"emergency"* (H.M. Government 2004d). The temporary legislation is authorised by the Queen through an Order of Council or by a senior Minister of the Crown if arranging for an Order of Council would cause serious delay (H.M. Government 2004d). This process circumvents the UK's parliamentary system, which is considered too slow to manage emergency legislative change, and the resultant temporary legislation may only be enacted for a period of 30 days, and then renewed for a further period of 30 days before it expires (H.M. Government 2004d, Houses of Parliament N.D.). These provisions are *"fairly broad and includes the use of military forces, the confiscation of property and the prohibition of movement or forced movement in the event of an emergency";* they must satisfy conditions outlined in Section 22 (O'Brien 2006) (p 71). Coordination of the temporary legislation is facilitated by senior Ministers appointed as Emergency Coordinators for affected parts of the UK, other than England, and Regional Nominated Coordinators for specific affected regions as defined in Section 24 of the CCA (H.M. Government 2004d).

The powers afforded are limited by Section 23 (of the CCA) and may not amend the CCA (2004) Part 2 or any element of the Human Rights Act (1998) (H.M. Government 2004d, H.M. Government 2014c). They cannot be used to instigate martial law, undermine the Parliamentary process, or to ban political parties or any similar activity; they are a mechanism of last resort (H.M. Government 2004a). All other options must be exhausted and even this is no guarantee as *"arrangements at a local level cannot assume that emergency powers will be made available as their use is subject to robust set of safeguards, they can only be deployed in exceptional circumstances"* (H.M. Government 2013d). Conceivably, the powers as a tool of government could be refused even if absolutely necessary if deemed politically damaging.

- **Key Point 31: The Emergency Powers afforded by Part Two of the CCA are a mechanism of last resort**

2.5.5 Emergency Management in the United States of America

Since its founding as a federal republic on 4th July 1776 the modern United States of America (US) has experienced frequent and often devastating natural and man-made disasters (Disasterium 2013, Reynolds 2009). For example the Galveston, Texas hurricane of 1900, which killed around 6,000 people (Keim 2009, Tierney and Trainor 2004, Valcik and Tracy 2013), the San Francisco earthquake of 1906, which killed approximately 3,000 and caused $500,000,000 in damage (Fradkin 2005, Penna 2013), the Love Canal pollution incident in Niagara Falls, New York during the 1940s and 1950s (Beck 1979), the partial nuclear meltdown at Three-mile island, Pennsylvania in 1979 (Walker 2004), and the Exon Valdez grounding and oil-spill in Prince William sound, Alaska in 1989 (Exxon Valdez Oil Spill Trustee Council N.D., Sylves and Comfort 2012).

The new millennium saw this trend continue. The 9/11 terrorist attacks killed 2,996 people and sent shockwaves across the globe and may well have been the defining moment of a generation (9/11 National Memorial and Museum 2005, Liu et al. 2009, Perrow 2006, Utley 2012). These attacks and the resultant wars in Afghanistan, Iraq and elsewhere have influenced public opinion and policy around the world and continue to do so (Cole 2006, Liu et al. 2009). Indeed, it may be argued these events have altered the course of global-affairs establishing a new-normality by setting the world on a path from which it may never be able to turn back from (Kotler and Casoline 2009).

The Bush Administration responded to perceived emergency management failures of 9/11 with the formation of the Department of Homeland Security (DHS) and a seemingly unwavering focus on counter terrorism, re-focusing US federal emergency management on terrorism (Birkland 2009). These events arguably contributed to the visceral failures of the 2005 response to Hurricane Katrina, which saw 1,833 fatalities, and constitutes the US's lowest-ebb in emergency management terms; resulting in significant legislative and organisational change (Love 2006, McAleavy 2006, National Emergency Management Association 2006, Quarantelli 2006, Waugh 2006, Waugh 2009b).

The US has continued to experience disasters; the 2010 Deepwater Horizon oilrig explosion killed 11 oil-workers and caused the largest marine oil spill in history (Cleveland 2010, Konrad and Shroder 2011). Super-storm Sandy in 2012 caused 72 direct and 83 indirect fatalities, and damages exceeding $71.4 billion (Federal Emergency Management Agency 2013a, National Oceanic and Atmospheric Administration 2012a). In 2014 a significant mudslide resulting from the collapse of an unstable hill in Oso, Washington caused 43 fatalities (Crager 2014, United States Geological Survey 2014c). And, in 2015 the Carolinas flooded causing $12 billion in damages and 25 fatalities (Federal Emergency Management Agency 2015c). Though not an exhaustive chronology these occurrences collectively demonstrate the US's significant

"disaster" and indeed *"catastrophe"* experience. Conversely, as noted previously the UK's experience is located towards the lower end of Quarantelli's typology (Quarantelli 2006, Wachtendorf, Brown and Holguin-Veras 2013).

- **Key Point 32: The UK incident chronology consists of only *"emergencies"* and low-level *"disasters"***

- **Key Point 33: The US has a considerable history of *"emergencies"*, *"disasters"* and *"catastrophes"***

2.5.6 The US Governance System

Since 1776 the US Federal Government has maintained a system of checks and balances designed to ensure that no one person can amass too much power: accordingly power is split between 3 distinct branches of government, namely Legislative, Executive and Judicial (Storey 2010, White House 2014a). Similarly, within the union each of the 50 US states retains a considerable degree of autonomy and legal powers, which are granted under the 10th Amendment of the US Constitution, also known as *"the Bill of Rights",* which seeks to balance power across a tiered governance structure containing federal, state, local and tribal levels of government (US Bill of Rights 1791).

State Governments are generally modelled on the federal structure consisting of an *"Executive Branch"* led by a Governor, a *"Legislative Branch"* made up of elected representatives and a *"Judicial Branch"* led by a State Supreme Court (White House 2014b). Within each state are Local Governments, which are separated into 2 distinct tiers with differing responsibilities namely, counties sometimes called boroughs or parishes, and municipalities sometimes named cities or towns in a number of states (White House 2014b). Federal and State governments share power in numerous ways: however, Local Government must be granted power by the State (Cornell University Law School 2014, Fairfax County N.D.). Also, each State contains a number of Native American tribal nations, which are recognised by the US Constitution, and have a voice in local, state and federal politics (Gray 2013, US Department of the Interior 2014). The US governance system is complex with the Federal Government retaining certain exclusive powers and others being delegated to States - see Fairfax County (N.D.) for further information. Thus, some activities may be legal in a particular State and illegal in the neighbouring one, which can raise issues when trying to establish uniform standards and *"potential for standardisation in emergency management is limited"* which may conceivably be a result of governance fragmentation limiting federal influence and ability to direct in terms of policy implementation across the US (Jensen and Youngs 2015) (p 362).

Key Point 34: US governance is a complex system of checks and balances consisting of federal, state, local and tribal levels of government

2.5.7 Federal Emergency Management

For over 200 years US legislators have understood the need for a Federal Government that provides assistance to its citizens when disaster strikes (Anna Marie College 2014). The first evidence of this can be traced to the 1803 fire at Portsmouth, New Hampshire. Following this incident US Congress passed the Congressional Act of 1803 to provide relief to merchants and is considered the first piece of federal disaster legislation (Falkenrath 2001, McElreath et al. 2007, Wrede 2013). Congress facilitated relief to stricken communities across the US more than 100 times through provisions afforded by the Act of 1803 until the 1930s when the federal government incorporated disaster relief through economic measures designed to invigorate the US economy following the Great Depression (Anna Marie College 2014, Bernstein 1987).

During the 1930s President Roosevelt strove to develop a more active federal role in disaster relief establishing new agencies and programmes; the Reconstruction Finance Corporation was empowered to provide loans for reconstruction and repairs of public facilities, the Bureau of Public Roads was authorised to provide grants for the repair of bridges and highways, and the Flood Control Act of 1936 commenced large-scale engineering programmes to erect hundreds of dams, dikes and levees to increase flood resilience across the country (Arnold 1988, Drabek 1991). Many State and Local Governments also began to establish their own emergency management programmes around this time (Drabek 1991).

2.5.7.1 Overview of Federal Emergency Management Legislation – Pre-2005

The threat of Mutually Assured Destruction following World War II coupled with a continuous rivalry between the US and the Soviet Union resulted in a Cold War that lasted almost 40 years and led to the rise of Civil Defence (Sylves 2008). Facing the threat of nuclear attack on an almost unheard of scale US lawmakers placed the burden of Civil Defence on individual states by the passing of the Civil Defense Act of 1950 by US Congress, creating the Federal Civil Defense Administration (FCDA) to formulate national policy and guidance in support of state activities (Peters and Wooley 2014a, Sylves 2008).

Fig 2.24 provides a synopsis of federal emergency management legislation pre-2001. Please note: structural and legislative changes following 9/11 terrorist attacks are discussed outside of Fig 2.24 due to the significant influence they have had on contemporary US emergency management, which necessitates in depth examination of their respective impacts on policy and practice.

Fig 2-24: Key Federal Disaster Management Legislation Pre-2001	
Legislation	**Synopsis**

The Federal Civil Defense Act of 1950 (FCDA)	The FCDA (1950) provides *"the basic framework for preparations to minimize the effects of an attack on our civilian population and to deal with the immediate emergency conditions which such an attack would create"* (Cohen and Boyer 1951). It sought to protect life and property in the event that the US should succumb to attack and focused on the provision of emergency welfare services for individuals and families, and also promoting a self-help ethos, influenced by UK wartime efforts during World War II, by providing funds for a shelter programme, early warning systems, stockpiles of supplies and public information campaigns (Cohen and Boyer 1951, Drabek 1991, Sylves 2008).
The Federal Disaster Relief Act of 1950 (FDRA 1950)	The FDRA was a limited response to serious flooding in the US Midwest, though it has proved to be highly influential establishing a clear framework and process that carried the US through 50 years of disaster experience (Sylves 2008). FDRA funding and support is provided to state and local governments in an orderly and continual way rather than by the earlier case by case basis. Also, the development of state and local emergency management organisations and plans is mandated (Baca 2008, Drabek 1991). The FDRA supplements state and local capabilities by authorising mandatory federal government relief through permanent legislation (Baca 2008). Assistance can be requested by a state Governor via the Presidential emergency declaration mechanism, which does not require congressional approval (Drabek 1991, Lindsay and Murray 2009, Sylves 2008).
The Disaster Relief Act of 1966 (DRA 1966)	Building on the federal-state-local support framework established within the FDRA, the DRA (1966) sought to enhance provision for catastrophic events as critics of the earlier legislation considered these provisions effective for routine disasters rather than larger-scale events (Lindsay and Murray 2009). The new measures enabled federal agencies to authorise loans below market rates to better assist disaster victims, refinance federal home loans, and extend aid to unincorporated areas; provide food and unemployment assistance, areas which US experience of disasters in the

	1960s demonstrated were critical in terms of recovery (Comerio 1998, Rivera and Miller 2006).
The Disaster Relief Act of 1970 (DRA 1970)	The DRA (1970) updated the DRA (1966) by extending relief assistance to individuals and organisations, and businesses as well as states and local communities. It achieved this by strengthening the administration and coordination of federal disaster assistance by ensuring provision was codified, permanent and comprehensive (Moss 1999, Peters and Wooley 2015).
The Disaster Relief Act of 1974 (DRA 1974)	Continuing the trend of incremental change, the DRA (1974) contains *"several precedent-setting features"* (Lindsay and Murray 2009). It extends federal assistance for individuals, states and local communities by strengthening disaster planning and preparedness; mandating insurance against future losses as a requirement for federal assistance (Peters and Wooley 2014b). The main features of the DRA (1974) are 1. Direct assistance to individuals and households through the Individual and Family Grant (IFG) program (75% federal funding for state-administered programs that provided money to purchase clothing, furniture and essential needs following a disaster 2. Formalisation of mitigation activities (not just response) 3. Mandated that local, state and federal agencies develop disaster prevention strategies 4. Promoted an all-hazards perspective for the first time 5. Altered the *"Presidential Declaration"* mechanism to mechanism enable the President to issue a proactive declaration to mobilise federal resources when threaten by an imminent disaster Adapted from: (Lindsay and Murray 2009, Sylves 2008).
The Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988 (RTSA) – Underpinned by the	The RTSDRA was signed into US law on November 23rd 1988 ushering in the modern era of US emergency management (Federal Emergency Management Agency 2014e, Federal Emergency Management Agency 2014f, Sylves 2008). It provides the legal authority for federal assistance and stipulates what can be provided (Association of State and

Federal Code of Regulations – 44	Territorial Health Officials 2014a). It also enables the president to issue a major disaster or emergency declaration by defining criteria and set types of assistance that may be authorised (Sylves 2008). State governors must develop emergency management apparatus and implement them should disaster occur, and should it exceed a state's coping capacity then written confirmation of the need for federal assistance is required to secure federal assistance. Should a request not be forthcoming the RTSDRA contains a mechanism that enables the president to accelerate federal assistance should it be necessary to save lives or prevent severe damage (Association of State and Territorial Health Officials 2014a, Federal Emergency Management Agency 2014f).
Federal Preparedness and Response Act of 1993 (FDPRA 1993)	The FDPRA (1993) amended the Stafford Act encouraging FEMA to be more proactive in disaster preparedness. The act also clarified the roles of federal, state, local and private stakeholders and established an inventory of disaster response resources, whilst developing a more effective process for private sector and volunteer engagement, improving state and local damage assessment and federal assistance mechanisms to enhance state and local capability (Waugh 1994).
Additional sources: (Bea 2005, Center for Disaster Philanthropy 2014, Cohen and Boyer 1951, Cohen and Boyer 1951, Drabek 1991, Peters and Wooley 2014a, Sylves 2008)	

The incremental evolution of US federal disaster legislation mirrors the development of the UK legislation. However, the implementation of the CCA (2004) established a single-framework, whereas the US remains somewhat fragmented in its legislative approach (H.M. Government 2004a, Kapucu 2010). This is perhaps a reflection of the disjointed governance structure, with Federal and State laws and differing laws between individual States, which is significantly different to the UK. However, the re-election of the UK Conservative government in early 2015 with the promise to devolve further powers to Northern Ireland, Scotland and Wales, and discussion on enhancing powers of local authorities in England could alter the balance of decision-making power further limiting the potential for standardisation (Jensen 2010b, Jensen and Youngs 2015).

- **Key Point 35: US emergency management legislation has evolved incrementally based on significant experience of disaster**

2.5.8 The Federal Emergency Management Agency

The origins of the contemporary Federal Emergency Management Agency (FEMA) can be found in proposals drawn up by the National Governor's Association during the late 1970s, and its establishment is credited to US President Carter, a former State Governor of Georgia with experience of natural disasters (Sylves 2008). Pre-1978 federal emergency management was fragmented as responsibilities were spread across 5 federal departments and agencies, which was deemed inefficient and in need of modernisation (May 1985, Sylves 2008). President Carter sought to restructure his administration developing Reorganization Plan No 3 of 1978; submitting his proposal in June 1978 he informed US Congress *"it will consolidate 5 existing federal agencies and 6 additional disaster-related responsibilities into a single structure"* (Peters and Wooley 2014c). FEMA was formally established as an independent agency by Presidential Executive Order in 1979, and assigned as the lead for emergency management (May 1985, Penuel, Statler and Hagen 2013, Sylves 2008). By design *"FEMA has the responsibility to encourage and influence better [emergency] planning and preparation of government at every level but little authority"* (Giuffrida 1985) (p 2). The agency operates within a power-sharing governance system where *"a key issue is the nature of federal influence upon subnational commitment and capacity"* (May 1985). Thus, FEMA provides *"guidance, leadership and when appropriate direct financial aid to communities planning for, and recovering from major emergencies of all kinds"* as opposed to dictating or controlling state and or local emergency management and through this mechanism federal funding was substantially increased (Giuffrida 1985) (p 2).

- **Key Point 36: FEMA is the lead federal agency tasked with providing emergency management guidance, leadership and financial support to State and Local governments**

FEMA absorbed a broad range of disparate agencies bringing together numerous federal disaster assignments and capabilities under 1 organisation, and responsibility for civil defence transferred from the Department of Defense (DOD) Defense Civil Protection Agency, though the rivalry between emergency management and civil defence in the US continued until the Federal Civil Defense Act was repealed in 1994 (Drabek 1991, Federal Emergency Management Agency 2010a, Sylves 2008). This reorganisation sought to enhance federal disaster provision as the executive order required that all federal agencies with disaster response capabilities cooperate with FEMA, though it did not put FEMA in charge rather it established an Emergency Management Council chaired by the FEMA Director to coordinate federal disaster response (Mener 2007).

2.5.8.1 The Evolution of the FEMA

FEMA has experienced a somewhat chequered history. Though, the agency has assisted many thousands of survivors it has been mired in numerous high-profile failures, which have led to considerable organisational change and a state of almost continuous flux (Federal Emergency Management Agency 2010a, Gerada 2014, Mandelstam 2007). The Love Canal contamination (Beck 1979), the Three-Mile Island nuclear meltdown (Walker 2004), and the Mount St Helen's volcanic eruption (United States Geological Survey N.D.), embarrassed the Federal Government resulting in organisational change. Furthermore, serious problems during the federal response to the Loma Prieta earthquake and Hurricane Hugo in 1989, and also during the response to Hurricane Andrew in 1992, which despite the much lauded implementation of the *"Federal Response Plan"* actually brought the very existence of FEMA under scrutiny (Adamski, Kline and Tyrrell 2006, Federal Emergency Management Agency 2010a, Franklin 1995, Waugh and Streib 2006).

Reforms initiated by FEMA Administrator James L. Witt in 1993, included streamlining of disaster response and recovery operations to reduce bureaucracy as the effectiveness of federal disaster response was often reduced by paperwork issues; greater emphasis and focus was placed on the preparedness and mitigation phases and on customer service (Coppola 2006, Federal Emergency Management Agency 2010a, Schneider 1998). Also, the cessation of cold-war hostilities released civil defence resources which were reassigned to disaster relief, recovery and mitigation programmes to augment Witt's reforms, which were to be tested almost immediately by the Great Midwest floods of 1993 (Galloway 2005, Johnson, Holmes Jr and Waite 2003) and the Northridge Earthquake of 1994 (Comfort 1994, Tierney 1994), generally standing up well to these challenges (Federal Emergency Management Agency 2010a, Franklin 1995). However, in 1995 an event occurred that could hardly be defined as a disaster in either the natural hazards or Quarantelli sense that arguably set the agency on a course that would ultimately result in its greatest failure: the collective response Hurricane Katrina in 2005.

2.5.9 Terrorism: the birth of the Department of Homeland Security (DHS)

Throughout the 1970s-1990s global terrorism was a mounting concern for the US (Hoffman 1998). Operation Eagle Claw, the failed attempt to rescue 52 hostages from the US embassy in Tehran, Iran in April 1980 embarrassed the US administration, ultimately costing President Carter a second term (Cogan 2003, Haney 2002). On 18th April 1983 the US Embassy in Beirut, Lebanon was attacked by a suicide bomber driving a pick-up truck loaded with explosives killing 17 and on 23rd October the same modus-operandi was used to attack the US Marine Corps Barracks at Beirut International Airport killing 241 US Marines and injuring 1000 more (Reuters 2014). On 26th February 1993 the World Trade Centre in New York was attacked when a truck laden with explosives was parked in a garage below the north tower, the explosion

killed 6 and injured more than 1,000 (Copeland 2007). However, it may be argued that events that took place some 2 years later in 1995 seem to have provided the catalyst for a dangerous policy shift that would have dire consequences. On 19th April 1995 Timothy McVeigh an anti-government activist, detonated a truck-bomb outside the Alfred P Murrah Federal Building in Oklahoma City, Oklahoma killing 168 and injuring many hundreds in what was at the time the worst terrorist attack on US soil (Copeland 2007, Federal Bureau of Investigation N.D., Martin 2015).

The Clinton administration responded with the introduction of the Anti-Terrorism and Effective Death Penalty Act of 1996 (AEDPA) closely followed by the Defense Against Weapons of Mass Destruction (WMD) Act of 1996 which required the Department of Justice (DOJ) and FEMA to train fire fighters in WMD response and the formation of Rapid Terrorism Response Teams across the country (Carter, Deutch and Zelikow 1998, Federal Emergency Management Agency 2010a, Peters and Wooley 2014d). This policy realignment adjusted focus on counter-terrorism placing far greater emphasis on *"catastrophic"* terror and WMD, which, is at odds with the initial natural-hazards recovery tasking and prevention and mitigation roles undertaken by FEMA, and indeed by the wider Federal Government prior to FEMA's establishment (Giuffrida 1985, Waugh 2009b).

Further terrorist attacks against US interests occurred. On 7th August 1998 a series of co-ordinated truck-bomb attacks against the US Embassies in Dar e Salaam, Tanzania and Nairobi, Kenya killed 11 and 213 people respectively with several hundred and 4,000 injuries at each of the blast sites (Copeland 2007). Also, on 12th October 2000 a small-boat detonated alongside the warship the USS Cole in Aden, Yemen killing 17 sailors and wounding another 39 (Abkowitz 2008). A logical defence of the terrorism focus can be made based on the frequency and perhaps the high-profile media-coverage of these events. However, it is worth noting that none of these attacks were truly *"catastrophic"* in the Quarantelli sense. Indeed, even 9/11, whilst thousands died, did not resemble a *"catastrophe"* as it did not comprehensively overwhelm the emergency response (Mener 2007).

- **Key Point 37: US emergency management policy and practice is heavily influenced by and focused on terrorism**

2.5.10 9/11 Terrorist Attacks

On the morning of 11th September 2001 Islamic terrorists hijacked 4 commercial jetliners in US airspace as part of a co-ordinated suicide attack. A first[t] aircraft struck the North tower of the World Trade Centre in New York at 08:46 am; a second aircraft then struck the Centre's South tower at 09:03 am. At 09:37 am another of the 4 jetliners crashed into the Western side of the Pentagon in Arlington, Virginia. At 09:58 am the South tower collapsed. At 10:03 am the fourth aircraft crashed in a field outside Somerset County, Pennsylvania as passengers heroically

attempted to wrestle control of the aircraft from the hijackers. At 10:28 the North tower collapsed (9/11 Commission 2004, 9/11 National Memorial and Museum 2005, Valcik and Tracy 2013). The world looked on, as 2,996 lives were lost that day (British Broadcasting Corporation 2001).

The attacks reinforced, and for many, validated the earlier focus on terrorism despite the generally acknowledged effectiveness of the 9/11 response, strengthening calls to establish a new federal agency to counter this seemingly imminent terrorist threat (9/11 Commission 2004, Adamski, Kline and Tyrrell 2006, Birkland 2009, New York City Fire Department 2002). The paramilitary rhetoric surrounding post 9/11 emergency management in the US was reminiscent of the Cold War adding fervour to the drive for change (Mener 2007, Monahan and Beaumont 2006). After initially resisting, President Bush signed the Homeland Security Act of 2002 and the Department of Homeland Security (DHS) came into being on January 24th 2003 (107th US Congress 2002, Department of Homeland Security 2014a, Sylves 2008).

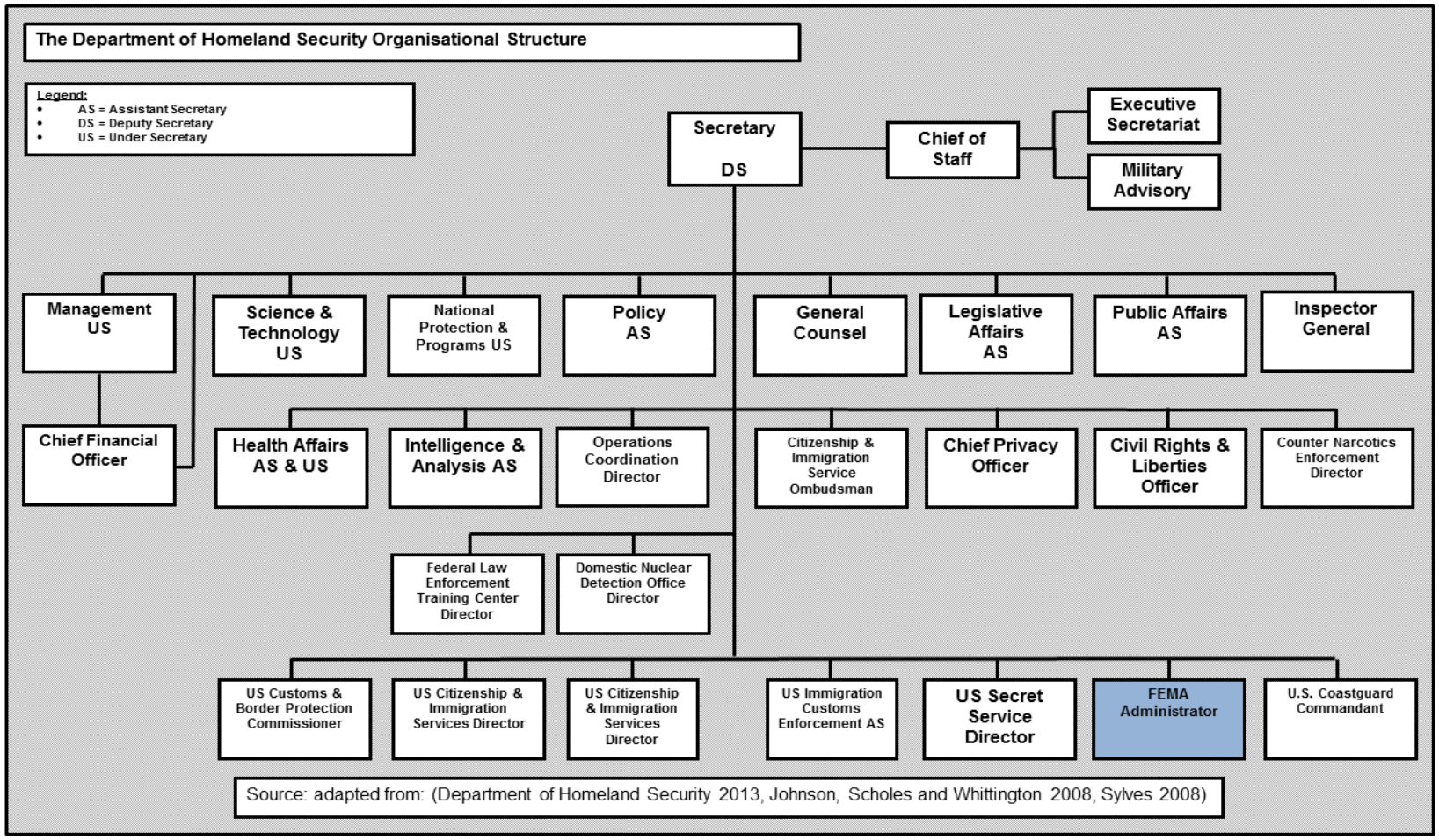
- **Key Point 38: 9/11 terrorist attacks validated the counter terrorism policy focus leading to a reorganisation of US emergency management**

2.5.11 The Homeland Security Act of 2002 and the Department of Homeland Security (DHS)

The new federal agency ushered in a *new dawn* for emergency management in the US one focused on counter-terrorism response. Gone was the Witt era focus on mitigation and natural hazards, arguably FEMA's most prestigious era (Haddow, Bullock and Coppola 2007, Roberts 2006), replaced by the Bush administration's War on Terror focus on WMDs and mass casualty terrorism (Bea 2007, Birkland 2009). FEMA was integrated with 21 other federal agencies (see Fig 2.25) even a cursory glance demonstrates a clear security/counter-terrorism focuses. Ironically, despite a great number of the pre-9/11 failings being attributed to lack of integration across the US intelligence community, the formation of DHS did not draw in any of these agencies (Perrow 2006). FEMA's traditional preparedness functions were reassigned to the DHS Directorate of Emergency Preparedness and Response, and further programmes were transferred to the DHS Office of State and Local Government Co-ordination and Preparedness, in 2005 with mitigation, response and recovery being retained by FEMA (Bea 2007, Federal Emergency Management Agency 2010a, Mener 2007). The Agency was removed from the US Cabinet becoming an internal division buried within layers of bureaucracy (see Fig 2.26) this coupled with the terrorism focus and *red-tape* hand-cuffed the agency, diluting the natural hazards focus, arguably contributing to the failure that was the response to Hurricane Katrina (Adamski, Kline and Tyrrell 2006, Johnson, Scholes and Whittington 2008, McAleavy 2006, Sobel, Coyne and Leeson 2007).

Fig 2-25: Federal Agencies absorbed by DHS	
Agencies absorbed into the Department of Homeland Security (2003)	
Agency	**Department**
1. US Customs Service	Treasury
2. Immigration and Naturalization Service	Justice
3. The Federal Protective Service	N/A
4. Transportation Security Administration	Transport
5. Federal Law Enforcement Training Center	Treasury
6. Animal and Plant Health Inspection Service	Agriculture
7. Office for Domestic Preparedness	Justice
8. Federal Emergency Management Agency	N/A
9. Strategic National Stockpile and the National Disaster Medical System	N/A
10. Nuclear Incident Response Team)	N/A
11. Domestic Emergency Support Teams	Justice
12. National Domestic Preparedness Teams	Federal Bureau of Investigation
13. Chemical Biological Radiological Nuclear (CBRN) Countermeasures Program	Energy
14. Environmental Measurements Laboratory (Energy)	Energy
15. National Biological Warfare Analysis Center	Defense
16. Plum Island Animal Disease Center	Agriculture
17. Federal Computer Incident Response Center	General Services Administration
18. National Commination System	Defense
19. National Infrastructure Protection Center	Federal Bureau of Investigation
20. Energy Security and Assurance Program	Energy
21. US Coastguard	N/A
22. US Secret Service	N/A
Source: adapted from (Department of Homeland Security 2014b)	

Fig 2-26: Department of Homeland Security (DHS) Organisational Structure



2.5.12 Hurricane Katrina 2005

During 25th-31st August 2005 Hurricane Katrina, a Category 5 storm, struck the Gulf of Mexico. At the time it was the fourth most powerful hurricane ever record in the Gulf (Federal Emergency Management Agency 2010a, National Oceanic and Atmospheric Administration 2012b). The storm was *"catastrophic"*; devastating areas of Alabama, Florida, Mississippi, Louisiana and New Orleans and, causing 1,883 deaths and approximately $75 billion in damages, concurrently stripping an area greater than the total landmass of the UK of all infrastructure expected in the modern Western world (Burton and Hick 2005, Committee on Homeland Security and Governmental Affairs 2006). The storm overwhelmed the emergency response; it may be argued that it comprehensively triggered all 7 criteria required to be classified as *"catastrophic"* on Quarantelli's typology (Quarantelli 2006, Wachtendorf, Brown and Holguin-Veras 2013). The subtle differences between disaster types, such as 9/11 and Hurricane Katrina were seemingly not understood; rather the Federal Government succumbed to pressure to do something and created DHS rather than fully assessing what was required following 9/11 (Mener 2007). Worryingly, the UK All-Party Parliamentary Group on Homeland Security recommended a British Department of Homeland Security be formed to enhance the efficiency, interoperability and resilience of the blue light emergency services indicating the UK may well succumb to pressure to do something rather than developing a fuller understanding of disaster scale, which is currently lacking in practice (Ellwood and Philips 2013).

Although, there is a considerable body of literature, a comprehensive analysis of the formation of DHS and the failures before and after Hurricane Katrina, which encompasses colonial history, development, politics, and social inequality in addition to emergency management is beyond the remit of this study (Burby 2006, Giroux 2006, Laska and Morrow 2006, Roberts 2005, Sobel, Coyne and Leeson 2007, Waugh 2006, Waugh 2007, Waugh 2009b). However, the discussion of the reorganisation and the impact of the subsequent failures on policy development are critical to understanding the incremental development of the US emergency management and Command and Control so this will be discussed herein (Mener 2007).

- **Key Point 39: The formation of the Department of Homeland Security, its primary terrorism focus and marginalisation of FEMA contributed to the failed response to Hurricane Katrina**

2.5.13 The Post-Katrina Emergency Management Reform Act of 2006 (PKEMRA)

In keeping with the tradition of post-disaster incremental change the Post Katrina Emergency Management Reform Act of 2006 (PKEMRA) was signed into law on 4th October 2006 by President Bush mandating further changes in US emergency management (National Emergency Management Association 2006). The PKEMRA re-aligned FEMA's position within DHS as it became a stand-alone Agency moving out of the Directorate of Emergency Preparedness and Response (Federal Emergency Management Agency 2010a). Perhaps, correcting the error of removing FEMA from the Cabinet, although short of a reinstatement, the FEMA Administrator became the *"Principal Advisor to the President, the Homeland Security Council and the Secretary of Homeland Security on emergency-management-related matters"* (109th US Congress 2006, Federal Emergency Management Agency 2010a).

- **Key Point 40: FEMA returned to independent Agency status in 2006 and the Administrator is the Principal Advisor on emergency management issues in the US**

PKEMRA consolidated all federal emergency management functions into FEMA elevating its status and autonomy, whilst protecting FEMA resources and assets from reassignment, arguably returning the agency to its pre-Bush era guise, albeit with enhancements (Haddow, Bullock and Coppola 2011). FEMA's traditional preparedness responsibilities were returned, a protection responsibility was created though not defined and a requirement for a housing strategy separate from but related to recovery was called for (Bea 2007). New grants and disaster assistance programmes were established; a Disabilities Co-ordinator and a Small State and Rural Advocate role as well as National and Regional Advisory Councils were established (Bea 2007, Federal Emergency Management Agency 2010a, National Emergency Management Association 2006).

Dave Paulison, former US Fire Administrator, took over as the FEMA Administrator while former US Coastguard Admiral Harvey Johnson was appointed as Deputy Administrator in 2006 (Federal Emergency Management Agency 2006, Federal Emergency Management Agency 2014k, Morrison 2006). PKEMRA also empowered FEMA to dramatically expand its workforce, doubling in size from 2005–2009 (Federal Emergency Management Agency 2010a). Many Senior Managers were appointed from military or para-military organisations where federal authority and discipline are the norm (Neal 2014), and a 1,600 strong disaster volunteer cadre FEMA Corps was recruited in 2009, which discredited conspiracy theorists claim was a government youth army (Corporation for National and Community Service 2014, Finley 2014, Haddow, Bullock and Coppola 2011).

With new leadership came a mandate to prevent another *"Hurricane Katrina"* and a firm top-down, arguably command and control direction in which compliance with federal emergency management was a pre-requisite for federal support, abandoning the established partnership-based approach (Federal Emergency Management Agency 2014j, Haddow, Bullock and Coppola 2011, Jensen and Youngs 2015). A key aspect of FEMA's work has been the development the National Response Framework (NRF) to replace the DHS led National Response Plan (NRP), which in turn was a development of the 1992 Federal Response Plan (FRP) (Federal Emergency Management Agency 2010a, Kapucu 2006). The NRF is the key federal Command and Control policy for disaster response within the US, it is an umbrella framework based on the all-hazards approach (Federal Emergency Management Agency 2008a). State and local emergency management are required to comply in order to receive federal grants and support thus compliance is arguably bought.

- **Key Point 41: US National Response Framework (NRF) compliance requires adherence to Command and Control doctrine**

2.5.14 FEMA Today

Today FEMA employs a full-time workforce of 12,000, has an annual budget of $12.5 billion in 2015 (Department of Homeland Security 2015), and is headquartered in Washington D.C. under the leadership of Administrator Craig Fugate. There are 10 Regional Headquarters located in major US cities, each, linking into numerous states supporting both state and local emergency management, and ready to deploy resources on request (Department of Homeland Security 2010, Federal Emergency Management Agency 2014g, Federal Emergency Management Agency 2014g). A Regional Administrator, who is responsible for the PKEMRA duties outlined in Fig 2.27, heads up each region:

Fig 2-27: PKEMRA FEMA Regional Administrator Duties
1. Work with non-federal partners in the region to coordinate and integrate emergency management
2. Develop regional capabilities for a *"national catastrophe response system"*
3. Coordinate the establishment of emergency communications capability
4. Staff and oversee regional strike teams
5. Designate a person responsible for developing plans that support the National Response Plan (NRP)
6. Foster the development of mutual-aid agreements within the region
7. Identify gaps in the region concerning the response to individuals with special needs
8. Maintain and operate a Regional Response Coordination Center
Source: adapted from (Bea 2007)

2.5.15 US State-Level Emergency Management

Under the US constitution each state is granted significant autonomy to the extent the federal role in disaster is ostensibly that of invited support (US Bill of Rights 1791)**.** The emergency management functions of the state are normally carried out by State Emergency Management Agencies, Divisions or Offices, termed State EMA herein (Federal Emergency Management Agency 2015a, Price 2007)**.** The actual names of these agencies vary considerably, for example, the Department of Defense, Veterans and Emergency Management (Maine Emergency Management Agency 2014), Division of Emergency Management (Florida Division of Emergency Management 2015), or Division of Homeland Security and Emergency Services (New York State Division of Homeland Security and Emergency Services 2015)**.** Key themes such as emergency, homeland security and management feature prominently although there is a lack of standardisation. Somewhat curiously, no reference to disaster or catastrophe could be found in any state EMA name, which perhaps infers a similar aversion to these terms as in the UK.

The role of state EMA is much like that of FEMA albeit within a specific geographic area. State EMAs coordinate individual and public assistance grant programmes for disaster mitigation, prevention, preparedness, response and recovery programmes state-wide much like their federal partners. They bring together a broad cross-section of stakeholders, whilst also providing guidance and assistance to county, local and tribal governments as necessary (California Governor's Office of Emergency Services 2011, Maryland Emergency Management Agency 2015, Virginia Department of Emergency Management 2012)**.** Their mission is *"to lessen the effects of disaster on the lives and property of the people of the state through leadership, co-ordination, and support in 4 phases of emergency management: mitigation, preparedness, response and recovery"* (Maine Emergency Management Agency 2015).

The State Director of Emergency Management is responsible for delivering the mission and normally reports to the State Governor who has legal responsibility for the safety and security of citizens, so when disaster strike *"the buck stops"* with the Governor (Larsen 2013, Office of the Governor Rick Perry 2014). Please note; each EMA defines their mission slightly differently though the core ethos is the similar. The mission statement of the Maine Emergency Management Agency (MEMA) is cited for 2 reasons. Firstly, it is concise giving a clear rationale, and secondly MEMA hosted the US field-study so it was a logical and defensible choice.

- **Key Point 42: Each US State Governor has a legal responsibility for the safety and security of his or her citizens.**

Federal funding is co-ordinated via one of the 10 FEMA Regional Offices; each state has a number of State Liaison Officers tasked with day-to-day support to expedite the federal support, which can be up to 75% of the cost of a given programme (Federal Emergency Management Agency 2014i, Jensen and Youngs 2015). The President or a Federal Agency Head may waive administrative but not statutory costs incurred by any grant programme (Federal Emergency Management Agency 2014e, Federal Emergency Management Agency 2014h, Sylves 2008). Similar to FEMA, State EMAs promote a whole community agenda embracing an all-hazards approach bringing together a range of stakeholders to prepare for, and should an emergency overwhelm a local community to respond and recover in support of local governments as necessary (Coppola 2006). Higher bodies facilitate guidance and resources; the US 3 tier system of local/tribal, state and federal governments offers more support options than the UK 2-tier Local and Central Government system. However, the US has significantly more experience of *"disaster"* and *"catastrophe"* which arguably necessitates a greater resource base (Federal Emergency Management Agency 2008a, H.M. Government 2013a, Sahin, Kapucu and Unlu 2008, Valcik and Tracy 2013).

2.5.16 The Role of State Emergency Operations Center (SEOC)

Under the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988 each state is required to maintain a State Emergency Plan (Federal Emergency Management Agency 2014e). A critical element of the plan and its supporting emergency management apparatus is the State Emergency Operations Centre (SEOC), which forms part of the Command and Control framework illustrated in Organigram 2. These facilities proactively monitor threats within a state, and when an incident occurs they can partially activate to provide advice, or fully activate with full state support, or both state and federal support depending on the nature and severity of the incident (Minnesota Department of Public Safety 2014).

The SEOC purpose is to facilitate support, guidance and material assistance whenever a disaster overwhelms local capacity. Many state EMAs will deploy a State Incident Management Assistance Team (IMAT) to support the responding local governments. These teams are self-sufficient; they do not take command of an incident but deploy into the afflicted area to support and coordinate access to state resources, in a similar manner to the support provided to the state by FEMA regional and national IMATs (Department of Homeland Security 2010, Indiana Department of Homeland Security N.D., Minnesota Department of Public Safety 2014, North Dakota Department of Emergency Services 2015). The SEOC supports the Governor, the State EMA and the deployed State IMAT to co-ordinate disaster response. Should a disaster threaten to overwhelm a state; the Governor has 2 support options available i.e. a request for Federal assistance in the form of a Presidential Disaster Declaration or mutual-aid from other states requested via the Emergency Management Assistance Compact (EMAC) (Bea 2010, Kapucu 2009b, National Emergency Management Association 2014a).

- **Key Point 43: Federal resources cannot be deployed into State unless officially requested by a State Governor via a disaster declaration**

2.5.17 Emergency Management Assistance Compact (EMAC)

The Emergency Management Assistance Compact (EMAC) is the inter-state mutual-aid mechanism that enables sharing of resources across state lines providing essential surge capacity when disasters overwhelm both local and state capacity (National Emergency Management Association 2014a, Waugh 2007). EMAC is a legislative mechanism covering licenses and permits, liability, compensation and reimbursement designed to eliminate legal barriers to inter-state mutual-aid. Adopted by all 50 US states it was introduced into US law in 1996, being developed as a result of the failures of the 1992 response to Hurricane Andrew (National Emergency Management Association 2014a, National Emergency Management Association 2014b). The mechanism's structure consists of 5 organisations, the National Emergency Management Association (NEMA) of which, all state EMA Directors are members, the EMAC Committee which is the managing body, the EMAC Advisory Group which facilitates multi-disciplinary integration, the EMAC Executive Task Force (ETF) that conducts the day-to-day work of the EMAC Committee, and the National Co-ordination Group (NCG) which supports NEMA with the daily policy and incident workings of EMAC (Federal Emergency Management Agency 2008c).

An impacted state can request whatever resources they need and for what price, inter-state and federal resources can be requested on an as needed basis; it is not an either or mechanism (Federal Emergency Management Agency 2008c). An assisting state is only required to provide support if they have the resource available and are able to deploy it then they are not compelled to respond without prior agreement; consequently the impacted state retains significant discretion and decision-making autonomy (Association of State and Territorial Health Officials 2014b, National Emergency Management Association 2014b). This freedom can sometimes become politicised, similar in nature to the UK CCA (2004) Emergency Powers, meaning requests for assistance and resources can be based on political motivations and sensitivities rather than disaster need, which was seemingly the case in the aftermath of Hurricane Katrina in 2005 (Burby 2006, Tierney 2001). Despite these intricacies, the state is perhaps the most resilient in the US emergency management system because it holds the greatest decision-making power and access to the significant resource base of the other 49 states via EMAC, and the federal system via the FEMA Regional Offices.

- **Key Point 44: US states hold great decision making power and can access considerable resources via EMAC and the federal system**

2.5.18 United States Local Emergency Management

US emergency management is based on the primacy of the local level consisting of the county and town or municipalities, which are closely linked to State Government (Waugh 1994). The basis of the US system is if the Local Government is overwhelmed; help can be sought from the state, and if the state is overwhelmed help can be requested either from another state or the Federal Government at the discretion of the Governor (Kapucu 2009b, Sylves 2008). Essentially, responsibility is devolved to the lowest level of government and the assumption is you should always be able to call for help and an extensive top-down support network has been established. However, top-down approaches are heavily criticised for being too inflexible when faced with disaster indicating a divergence of perspectives between academia and practice (Drabek and McEntire 2002, Jensen and Thompson 2015, Jensen and Youngs 2015, Kapucu 2006).

- **Key Point 45: US emergency management assumes you can always call for help from a state or the federal system**

County Emergency Management Agencies (County EMAs) are responsible for promoting whole community all-hazards comprehensive emergency management within their localities through planning, training, education and exercising for disaster (Kennebec County Emergency Management Agency N.D., Knox County Maine Emergency Management Agency 2015). Jensen et al (2014) argue recovery is neglected in comparison to mitigation, preparedness and response. This perspective is shared by Rubin (2009) as recovery is perhaps not the sexy part of emergency management and unlikely to garner as much media and political support as response meaning interest could easily wane over time. This factor coupled with a noted response bias may explain this phenomenon (Blaikie and Wisner 2004, Coetzee and van Niekerk 2012, Lewis, Phillip and Westgate 1976, Stehr 2001, Twigg 2004).

2.5.18.1 County Emergency Management

Typically, a County EMA may consist of a Director, who is critical to emergency management within the state, and a handful of staff (Jensen and Youngs 2015, Waugh 1994) often including a Sheriff or Paramedic on either a part-time or volunteer basis. Activities include community liaison, working with local partners as well as the public and private sectors to develop emergency plans and establish and manage Community Emergency Response Teams (CERT) (Federal Emergency Management Agency 2014l, Jensen 2009, Jensen and Youngs 2015, State of Maine 2014). Though responsible for coordinating and reporting on activities to state and federal authorities in support of grants they have little power to direct or compel action (Jensen 2009, Jensen and Youngs 2015).

CERT provides support to local agencies during every day emergencies and can facilitate an initial disaster response allowing time for a state or federal response to ramp up (Carr 2014, Carr and Jensen 2015). This provides an essential capability as the community is the first-

responder when disaster strikes, not the first professional on-scene, so having a trained and equipped unit embedded locally can potentially save additional lives while the formal services establish Command and Control (Brennan, Barnett and Flint 2005). Indeed, the issue of resources that emerge from within or converge upon the disaster zone is a critical issue as the ability of Command and Command to manage these organisational demands as the scale of a disaster increases has been questioned (Bissell 2013, Destro and Holguin-Veras 2011, Destro and Holguin-Veras 2011, Lagadec 2007, McAleavy 2010, McEntire 2007, McEntire 2015, Quarantelli 2006). Thus, there is a need for research that can bring practice and academia closer together to examine such an important function of emergency management.

2.6 Chapter Summary and Conclusion

The concept of disaster has been shown to be a multi-faceted and subjective concept. It is understood and defined in a variety of ways, and is manifested in the numerous perceptions individuals and organisations hold, meaning a universal agreement has so far eluded the field. This is perhaps surprising since disaster pre-dates human existence and has shaped physical life for millennia. Disaster is also embedded in the structures of humanity; it has influenced religion, mythology, ancient, historic and popular cultures shaping societies around the globe over many thousands of years. However, despite this human familiarity disaster research is less than 100 years old. Thus, the field is at an early developmental stage, and knowledge of how to systematically manage disaster is in its infancy, which necessitates this and all scholarly research as lives continue to be lost.

Command and Control is at the heart of UK and US emergency response. Current approaches originated in the 1970s but despite this comparative newness they are regarded as being as timeless as disaster itself, and are not seemingly questioned as deeply as the criticality of their role necessitates. This is perhaps a reflection of humanity's collective physical and social connection with disaster, a closeness that has seen a modern approach quickly morph into an unquestioned, entrenched and traditional *"something"* in a few decades aided by military and paramilitary influences. Rather, than being viewed simply as a tool to be developed, critiqued and if necessary replaced with better approaches. Command and Control is law, it is policy; it is a coordination system for multiple organisations; it is embedded in cultures and identities. It is also the fundamental philosophy that underpins UK and US emergency management. It is these things and more, but what it is not is infallible.

Some disasters are indeed bigger than others, which is clearly demonstrated within the literature. Yet, Command and Control routinely approaches each disaster as one and the same with limited to no real understanding of the implications of scale. Rather it purveys a *"the bigger it is just throw more resources at it"* view, which only works so far and at this point just how far is unknown. It is not that Command and Control does not work, rather what is unclear is up to

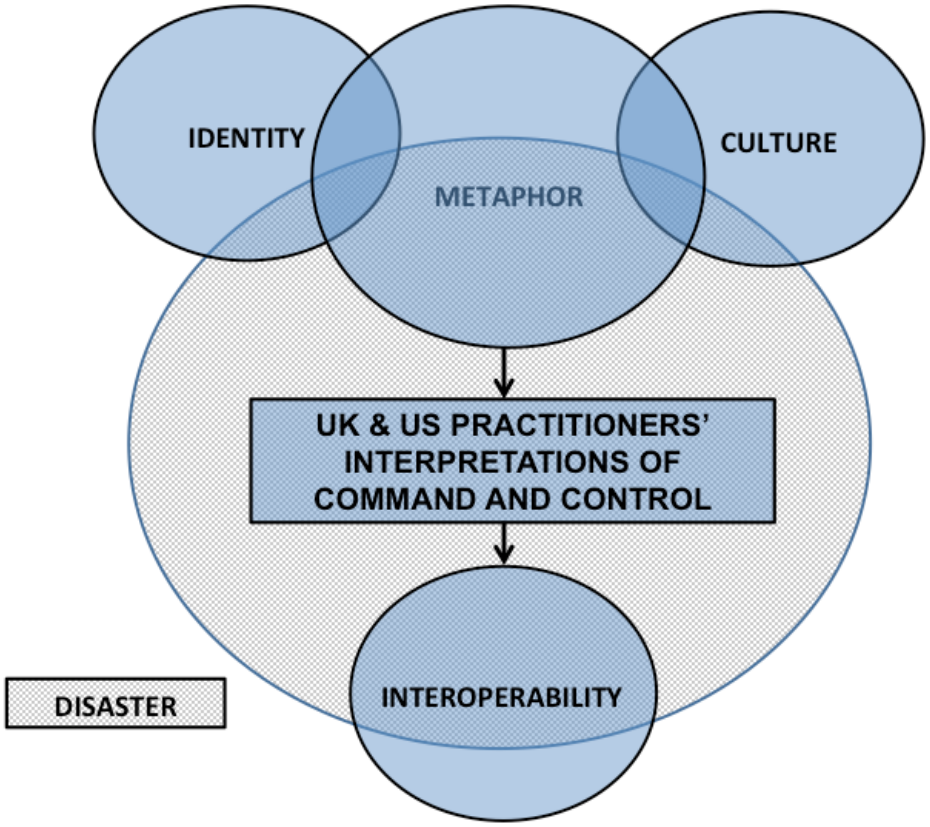
what point systems designed using Command and Control remain effective? The literature demonstrates Command and Control will fail, degrading as the scale of *"disaster"* increases to become a *"catastrophe"*. Whilst, some authors suggest the approach is inappropriate outside of a single-organisation context, others suggest it should not be used at all. However, the fact remains that it is in place now and will be used to combat the disasters of tomorrow. Thus, disaster scholars have a duty to develop and enhance the understanding of Command and Control in an accessible manner, as practitioners do not yet seem to be fully engaged with the academic disaster community or the wealth of knowledge that already exists. This must change.

The logical point of origin is developing an understanding of what Command and Control is and how practitioners in the field view it. This literature review presents identity, culture and metaphor within an organisations theory context as relevant and promising theoretical lenses, with which to explore Command and Control and interoperability. These functions are potentially critical weaknesses as success is reliant upon collective effort and coordination between key-organisations. Ideally, interoperability should be built on a shared understanding of Command and Control. However, a key building block is establishing if perceptual differences exist amongst practitioners by developing a means to communicate views between individuals and organisations as a stepping-stone towards interoperability and greater response efficiency. Metaphor provides an effective and innovative means to unlock the minds inner eye. Its communicative power can be harnessed, as it has been in organisations studies, to deepen our understanding of Command and Control and provide a mechanism to enhance interoperability through expressive imagery in both the linguistic and visual domains.

2.6.1 Theoretical Framework

Fig 2.28 below illustrates this study's Theoretical Framework. The core domain is disaster, identify, culture and the primary theory of metaphor are used to explore practitioner's interpretations of Command and Control in order to enhance multi-agency interoperability. The diagram represents the transitioning of these 3 theories into disaster research to address the research problem, namely interoperability.

Fig 2-28: The Theoretical Framework



2.6.2 Central Research Question (CRQ)

The framework established by the Aim and Objectives outlined the scope of this study. The creation of the literature review achieved Objective 1 and, led to the establishment of a Central Research Question (CRQ) and 4 Supporting Research Questions (SRQ). This focused the research to both ensure clarity of purpose and guide the development of the research methodology and strategy.

The CRQ is:

- *"How do U.K. and U.S. emergency management practitioners metaphorically interpret Command and Control?"*

2.6.3 Supporting Research Questions (SRQ)

The CRQ is underpinned by 4 SRQs, which are:

1. *Is Morgan's* (2007) *organisational metaphor theory relevant to UK and US emergency management?*

2. *What metaphors do UK and US emergency management practitioners use to make sense of Command and Control?*
3. *Does understanding of Command and Control vary across key organisations in UK and US emergency management?*
4. *Do interpretational differences in Command and Control affect the level of interoperability between emergency practitioners?*

3 Research Methodology and Method

3.1 Introduction

"Catastrophes" and *"disasters"* are part of life on earth (Quarantelli 2006). Indeed, it has been argued within the literature review that such incidents are increasing in terms of their scale, frequency and scope (Leaning 2013, Lewis, Phillip and Westgate 1976). This constitutes a significant need for research to increase knowledge and understanding of Command and Control to enhance interoperability and response capability. Accordingly, this chapter builds on the established Central Research Question (CRQ) to discuss and defend the philosophical underpinnings with reference to the ontological and epistemological location of this particular study. Whilst, also clarifying and defending the research design, selection of data collection and analysis methods, and explaining the practical application of these methods within the field.

3.1.1 Origins of the Research

The origins of the study are drawn from the author's practitioner experience, which encompasses over 10-years in emergency management across three different agencies, and reserve military service, namely, H.M. Coastguard (HMCG), the North East Ambulance Service (NEAS), Durham County Council Civil Contingencies Unit (CCU), and the Royal Naval Reserve (RNR). Command and Control was central to these roles, and included extensive training, exercising, and *"real world"* emergency management at the Gold (Strategic), Silver (Tactical) and Bronze (Operational) levels of command. The author was comprehensively immersed in the culture and practice of Command and Control in what can be described as a period of theoretical sensitisation (Mills, Bonner and Francis 2006) . These experiences and critical academic insights gained through MSc study developed a critical mind-set, and greater awareness of a broad range of theoretical perspectives and their relation to emergency management in the *"real world"*. Consequently, the author was keen to ensure that lived experiences and literature based understanding could benefit but not unduly influence or bias the direction of this study in order to enhance the knowledge base and richness of the overall thesis (Ayre 2004).

Theoretical sensitivity is a multidimensional concept linked to grounded theory and enshrined in the personal qualities of the researcher (Strauss and Corbin 1990) (p 41). It is concerned with the researcher's insights into the area of research, attunement to the intricacies and complexity of the participant's language, their construction and conveyance of words, actions and meaning; the ability of the researcher to reconstruct those meanings from the data captured, and an ability to *"separate the pertinent from that which isn't*" (Mills, Bonner and Francis 2006, Strauss and Corbin 1990).Although, not a formal component of the overt research design theoretical sensitivity represents an important factor in shaping the focus of

this study and in the construction of the CRQ. Thus, the relevance of this perspective to this study will now be clarified.

The author posits that his prior emergency management career constitutes a period of theoretical sensitisation that helped to shape the research problem, establish the CRQ and inform the research design process (Strauss and Corbin 1990). For over 10-years the author was immersed in Command and Control, engaging in complete participation by planning, training, exercising and responding to *"emergencies"* (Easterby-Smith, Thorpe and Jackson 2008). This multi-agency activity embraced the differing cultures, identifies, uniforms, politics and levels of command within HMCG, NEAS and CCU. Through experiencing *"real-world"* challenges and difficulties associated with multi-agency Command and Control in different guises the author developed a critical perspective that aided in the identification of the research problem (Van de Ven 2007). This inquiring mind-set helped form the question of *"do emergency management practitioners view Command and Control in the same way?"* This premise, that of a fragmented and non-universal conceptualisation of such a key-aspect of emergency management, which maybe organisationally or individually specific underpins the CRQ, and is indicative of a verifiable need for rigorous scholarly research to promote and ideally enhance multi-agency interoperability.

3.1.2 Formulating the Central Research Question (CRQ)

Einstein quoted in Van de Ven (2007) (p 71) states that *"the formulation of a problem is often more essential than its solution, which may be merely a matter of mathematical or experimental skill"* highlights the importance of the problem formulation as a precursor to effective research design. Van de Ven (2007) (p 71) argues that *"problem formulation plays a crucial role in grounding the subject or problem in reality, and directly affects how theory building, research design, and problem solving task are performed; yet researchers often overlook or pay little attention to problem formulation"* and outlines 4 interrelated activities which inform the base framework of this study:

1. Recognising and situating the problem
2. Gathering information to ground the problem and its setting
3. Diagnosing the information to ascertain the characteristics or symptoms of the problem
4. Deciding what actions or questions to pursue to resolve the research problem

(Adapted from Van de Ven (2007))

3.1.3 Recognising and Situating the Research Problem

At its most basic the research problem, is grounded within the various interoperability failures experienced by practitioners in both United Kingdom (UK) and United States of America (US)

when responding to *"disasters"* and *"catastrophes"* (Quarantelli 2006). These events may be interpreted as a demonstrable research problem in that interoperability failures have occurred and seemingly continue to do so despite significant investment in capability enhancement activities (Department of Homeland Security 2008, H.M. Government 2013c, H.M. Government 2013h, Massachusetts Department of Fire Services 2005). The UK JESIP framework outlines 8 critical domains for interoperability enhancement. Command and Control, Procedures, Roles & Responsibilities, Information Sharing, Risk Thresholds, Communications, Radio Usage, Acronyms and Terminology (H.M. Government 2013c). This study is situated within and validated by the primary JESIP research domain of Command and Control. The rationale behind this approach and logic underpinning the alignment of the study with JESIP is drawn from the author's previous career and current base at a British university. Accordingly, the research question and strategy were designed to extend JESIP by achieving a deeper and more critical understanding of Command and Control through the application of linguistic and visual metaphor. The Aim and Objectives detailed in the Introduction form part of a framework that is completed by the CRQ and the Supporting Research Questions (SRQ).

3.1.4 The Central Research Question (CRQ)

Stannard-Gromisch (2010) (p 1) suggests, *"research questions need to be precise, tractable and amenable to investigation"* arguing for the need to adopt a SMART approach informed by management theory (Locke 1968, Locke and Latham 2002). A SMART approach is a mnemonic which refers to the setting of objectives that are Specific (S), Measurable (M), Achievable (A), Realistic (R) and Time-Based (T) (Bogue 2005, Drucker 2011). Accordingly, the CRQ underpinning this study is:

- *"How do UK and US emergency management practitioners metaphorically interpret Command and Control?"*

To answer the CRQ a systemic research design informed by SMART methodology was adopted. Objective 1 was met through the development of a comprehensive literature review whereas Objectives 2, 3, 4 and 5 required the development of a research strategy that was appropriate to the stated Aim and Objectives, and reflected the needs of and resources available to the researcher, whilst also maintaining integrity through an ethically sound approach (U.K. Research Integrity Office 2014)**.**

3.1.5 Supporting Research Questions (SRQ)

The CRQ is underpinned by 4 SRQs that were designed to complement the CRQ and ensure the Aim was achieved:

1. *Is Morgan's* (2007) *organisational metaphor theory relevant to UK and US emergency management?*
2. *What metaphors do UK and US emergency management practitioners use to make sense of Command and Control?*
3. *Does understanding of Command and Control vary across key organisations in UK and US emergency management?*
4. *Do interpretational differences in Command and Control affect the level of interoperability between emergency practitioners?*

3.2 The Philosophy of Research

3.2.1 The Concept of Research

The concept of research is one that is grounded in historical trends and varied perspectives applied in both the traditional sciences, such as biology, chemistry and physics, and more recently the social sciences (Henn, Weinstein and Foard 2006). In a generic sense research may be defined as *"a systematic investigation to find answers to a problem"*, and trends have generally advocated the traditional objective scientific method of quantitative research employed in an attempt to establish general laws or principles (Burns 2000). This methodological approach has dominated research practice cross-domain ultimately defining what methods have been traditionally viewed as valid. However, a shift in perspective in the 1960s brought a subjective, qualitative and naturalistic approach to the fore, which became progressively more influential during the 1980s (Bryman and Bell 2011, Burns 2000).

The CRQ is focused on identifying emergency management practitioner's individual metaphorical interpretations of Command and Control. Essentially, this study is focused on how they (the participants) see, feel and experience Command and Control. Consequently, this study is social in nature rather than hard or traditional science based. This is because the research approach is not focused on identifying absolute truth or universal laws rather collating personal insights and perspectives, which are essentially individual, and then mapping any similarities and differences between these interpretations.

Social science research *"is conducted in order to extend our knowledge about some aspect of social life that we are interested in"* (Henn, Weinstein and Foard 2006) (p 7). The aspects of social life of interest within this study are the respective U.K. and U.S. Command and Control frameworks, which provide the central focus (Wasserman and Faust 1994). These socially-based concepts were defined, critically reviewed, evaluated and illustrated diagrammatically in the literature review, and are referred to herein simply as Command and Control.

3.2.2 Contrasting Traditions: Positivism, Critical Realism and Interpretivism

Easterby-Smith et al (2008) argue that there are 2 contrasting views of how social research should be conducted, notably the traditions of positivism and interpretivism. These competing perspectives are aptly described as being *"in the red corner positivism; in the blue corner social constructionism".* Such phraseology is perhaps more akin to a boxing match than an epistemological discussion, but none-the-less this metaphorical expression serves to adequately illustrate the opposing positions, which have each to some extent been elevated into a stereotype, with critical realism somewhere in the moderate-middle. That said, *"when one looks at the practice of research, even self-confessed extremists do not hold consistently, to one position or the other"* (Easterby-Smith, Thorpe and Jackson 2008) (p 22). This suggests that the process of situating a research study within a given philosophical domain is to some extent subjective irrespective of the epistemological and ontological perspectives adopted (Bryman and Bell 2011, Easterby-Smith, Thorpe and Jackson 2008, Saunders, Lewis and Thornhill 2007).

3.2.3 Positivism

The positivist approach is based on the view that, in the social as well as the natural sciences, sensory experiences and their logical and quantitative treatment are together the exclusive source of all worthwhile knowledge: introspective and intuitional attempts to gain knowledge are rejected (Saunders, Lewis and Thornhill 2007). The view that positivism offers the best way of investigating human and social behaviour originated as a reaction to metaphysical speculation and the reducing influence of religious and theological certainty (Aiken 1956). As such, this philosophy has developed into a distinctive paradigm over the last 150 years (Easterby-Smith, Thorpe and Jackson 2008). Furthermore, Easterby-Smith, Thorpe et al (2008) argue that this term paradigm, referring to the domains of positivism and interpretivism, has come into vogue among social scientists, particularly through the work of Kuhn (1996), who used it to describe the progress of scientific discoveries in practice, rather than how they are subsequently reconstructed within text books and academic journals.

Positivism is a shorter-reference form of positive philosophy, a term originally coined by Auguste Comte (1798–1857), a French philosopher who is accredited as the founder of sociology and of the doctrine of positivism, and also the first philosopher of science in the contemporary 19th and 20th century sense (Easterby-Smith, Thorpe and Jackson 2008). Kolakowski (2004) argues that positivism stands for a certain philosophical attitude to human knowledge: strictly speaking, it does not prejudge questions about how men (and women) arrive at knowledge, neither the psychological nor the historical foundations of knowledge. However, it is a collection of rules and evaluative criteria referring to human knowledge, which tells us what kind of contents in our statements about the world deserve the name knowledge and supplies us with norms that make it possible to distinguish between that which may and may not reasonably be asked (Kolakowski 2004). Hacking (1981) defines 7 characteristics of positivism namely, the belief in realism, demarcation, cumulative science, observation-theory

distinction, observation and experimentation as the foundations for and justification of hypotheses and theories, deduction, precision, justification and context of discovery and unity of science (1 science about 1 real world).

Positivism is an epistemological position that advocates the application of the methods of the natural sciences to the study of social reality and beyond (Bryman and Bell 2011). The world exists externally and its properties should be measured through objective methods as opposed to being subjectively inferred through sensations, reflection of intuition (Bryman and Bell 2011, Easterby-Smith, Thorpe and Jackson 2008). Bryman and Bell (2011) (p 15) argue that the positivist paradigm is grounded in 5 principles:

1. Only phenomena and hence knowledge confirmed by the sense can genuinely be warranted as knowledge (the principle of phenomenalism)
2. The purpose of theory is to generate hypotheses that can be tested and that will thereby allow explanations of laws to be assessed (the principle of deductivism)
3. Knowledge is arrived at through the gathering of facts that provide the basis for laws (inductivism)
4. Science must (and presumably can) be conducted in a way that is value free (that is objective)
5. There is a clear distinction between scientific statements and normative statements and a belief that the former are the true domain of the scientist

Adherence to the positivist paradigm signifies acceptance of various ontological assumptions about the nature of reality, such as a belief in 1 *"real world"* (Easterby-Smith, Thorpe and Jackson 2008, Hacking 1981, Saunders, Lewis and Thornhill 2007). However, even within the positivist paradigm itself, there are a number of competing viewpoints that arguably constitute subsets or sects of positivism, namely realism and relativism. Easterby-Smith, Thorpe et al (2008) assert that traditional realists start with the position that the world is concrete and external, and that science can only progress through observations that have a direct correspondence to the phenomena being investigated. Bhaskar (1989) labels this position as transcendental realism, which assumes the ultimate objects of scientific inquiry exist and act (for the most part) quite independently of scientists and their activity. Internal realists however concentrate more on the process of observation (epistemology), which have emerged in response to advances in physics (Easterby-Smith, Thorpe and Jackson 2008).

For internal realists the point is not whether phenomena are concrete or not as it is only possible to gather indirect evidence of what is going on in fundamental physical processes, as one must accept that scientific laws once discovered are absolute and independent of further observations (Putnam 1987). Bryman and Bell (2012) dissect the realist position defining 2

further sub-sects: empirical realism, which simply asserts that through the use of appropriate methods, reality can be understood, and critical realism, which is a specific form of realism whose manifesto is to recognise the reality of the natural order.

The relativist position on the other hand, argues Easterby-Smith, Thorpe et al (2008) goes a stage further in suggesting that scientific laws may not be quite so immutable citing Latour and Woolgar's (1988) research within laboratories. Their work noted how ideas only gained acceptance as being true after much debate and discussion, which is also tied in to the personal careers and statuses of the main protagonists suggesting an element of subjectivism. Similar debates abound within the social sciences concerning the 3 key ontological positions representationalism, relativism and nominalism, which arguably reduces or at least weakens the positivist approach. The first 2 correspond roughly to the internal realist and relativist viewpoints of science, although the subject matter of social science is people rather than physical objects: whereas, the nominalist position asserts that it are the labels and names we attach to experiences which are crucial (Easterby-Smith, Thorpe and Jackson 2008).

3.2.4 Critical Realism

The critical realist paradigm is *"a philosophical system developed by the Indo-British philosopher Roy Bhaskar in collaboration with a number of British social theorists, namely Margaret Archer, Mervyn Hartwig, Tony Lawson, Alan Norrie and Andrew Sayer"* (Gorski 2013) (p 658). Critical realists tend to reject the concepts of positivism and empiricism, and interpretivism and constructivism as being equally problematic, advocating that realism *"seems like the only way forward if one wishes to call off the search for general laws without simply abandoning the goal of causal explanations"* (Gorski 2013) (p 659). The critical realist paradigm combines a general philosophy of science (transcendental realism) with a philosophy of social science (critical naturalism) to describe an interface between the natural and social worlds, and is based on a 2-fold critique against positivism and interpretivism (International Centre for Critical Realism 2014a). The critical realist paradigm is grounded in 5 principles (Hirschheim N.D., International Centre for Critical Realism 2014b, Sayer 1999):

1. The *"world"* exists independently of our knowledge of it
2. Observable phenomena provide credible data or facts
3. A distinction between the transitive (the changing knowledge of things) and the intransitive (the relatively unchanging things which we attempt to know)
4. Research is value-laden, the researcher is biased by world views, cultural experiences and upbringing, which impact on the research
5. Knowledge is grounded in thought, habits or customs, models or language and is influenced by prevailing economic, political and cultural authority
6. The role of theory is to initiate change in social relations to eliminate domination

The influence of the critical realist paradigm is growing as it is seen to offer a more reasonable and useful framework from which to engage with contemporary philosophical, scientific and social challenges (Lopez and Potter 2001). The paradigm is an alternative to positivism and the radical rejections of traditional science often associated with the interpretivist paradigm (Archer et al. 2007, Sayer 1999). However, despite the relative strengths of both paradigms, namely the widely accepted nature of positivism and the increasing popularity of critical realism, this particular study rejects both approaches due to ontological and epistemological considerations.

Ontology in the social sciences is focused on the nature of social entities, such as Command and Control (Bryman 2012). The concept of ontology refers to the branch of meta-physics focused on the study of theory or being, not of being itself, so to have an ontology is to have a theory of what exists; meaning ontology is therefore non-optional (Fleetwood and Ackroyd 2004). The positivist ontology founded on a belief in the existence of one truth (Bryman and Bell 2011, Easterby-Smith, Thorpe and Jackson 2008, Walsh and Wigens 2003) is not compatible with this study, as this paradigm does not reflect the author's ontological and epistemological positions, which will be clearly articulated later in this chapter. Neither is the critical realist ontology, which also advocates the existence of an external world that exists independently of the researcher (Hirschheim N.D., Sayer 1999). The critical realist notion that an *"entity can exist independently of our knowledge of it"* is based on Bhaskar's ontology and contradicts the philosophical underpinnings of this study, and is thus rejected (Fleetwood and Ackroyd 2004).

Epistemology is the branch of philosophy concerned with the nature of knowledge itself, its possibility, scope and general basis (University of Idaho N.D.). Epistemologies contain general sets of assumptions about the best ways of inquiring into the nature of the world and significantly influence research design (Easterby-Smith, Thorpe and Jackson 2008).

Positivist epistemology considers observable evidence as the only form of defensible scientific finding, assuming that only facts derived from the scientific method can make legitimate knowledge, and that the researcher must be separate from and therefore does not affect the outcomes of the research (Jansen, Spink and Taksa 2008). Similarly, critical realist epistemology advocates that only observable phenomena provide credible data or facts (Hirschheim N.D., Sayer 1999).

Fleetwood et al (2004) (p 28) criticises *"a wide-spread belief that whatever realism is, it is associated with positivism, or related discourses such as empiricism, scientism, science, scientific objectivity, structuralism, structural functionalism, foundationalism, modernism, enlightenment thinking"* arguing that this is a misrepresentation of critical realism that constitutes a stumbling block to its use. This viewpoint associates the paradigm with the natural

sciences and the search for laws: whereas *"critical realism, of course, explicitly denies that such laws exist in the social world"* (Fleetwood and Ackroyd 2004) (p 28).

The positivist and critical realist paradigms differ in other ways; firstly positivists argue that scientific research should not be value-laden advocating a primarily empirical base for scientific research (Bryman and Bell 2011). Whereas, critical realists counter that research is inherently biased as academics are politicised by world-views and events; their cultural experiences, norms and values and upbringing, and attempts to move beyond empiricism (Hirschheim N.D., Sayer 1999). Bhaskar (1975) (p 20) argues that *"empiricism makes reference only to experience (the empirical), but that events go far beyond what is experienced and the domain of real structures and other generative mechanisms require a larger conceptual map".* Consequently, *"empiricism rests upon deeply flawed confusion"* and thus critical realists cite retroduction as being epistemologically advantageous, overcoming the deficiencies of the logics of induction and deduction (discussed later in the chapter) to offer casual explanations (Blaikie 2004b, Olsen 2009).

The rationale behind this chapter so far is not to simply engage in a detailed critique of the positivist and critical realist paradigms. Rather, this section establishes the broad philosophical domain for the ontological and epistemological locating of this particular study as *"informed critique must be based on a clear understanding of the position (or range of positions) being examined"* (Phillips 1995) (P 5). This process enables the logic of positioning this study within an appropriate and justifiable research paradigm to be explained and a credible philosophical defence to be mounted.

3.2.5 Rejection of the Positivist and Critical Realist Paradigms

This study rejects both the positivist and critical realist paradigms as being wholly inappropriate to the stated research Aim and Objectives. Firstly, of paramount importance is that the author as a veteran of over 10 years in emergency management cannot feasibly adopt an external unbiased position. The author and reality of Command and Control, whatever the ontological perspective, are in this instance deemed inseparable. This contravenes a major tenet of positivism. Also, this study is not seeking to explain or establish casual universal laws, nor collate data on objective phenomena to enable scientific statements to be made: it is searching for something different.

The Aim of this study is to *"identify linguistic and visual metaphorical interpretations of Command and Control".* This statement arguably constitutes a rejection of the notion of positivistic truth uncovered through empirical scientific experimentation as such a viewpoint advocates that only phenomena and hence knowledge confirmed by the senses can genuinely be warranted as knowledge (Bryman and Bell 2011, Henn, Weinstein and Foard 2006, Walsh and Wigens 2003). Furthermore, the Aim is incongruent with the critical realist belief in

observable phenomena and of a world beyond our knowledge of it (Walliman 2006). Thus, both the positivist and critical realist paradigms are rejected in preference of a view that *"knowledge of the world is intentionally constituted through a person's lived experience"* (Weber 2004) (p iii). As a consequence, a suitable alternative to positivism and critical realism is required. Accordingly, the interpretivist paradigm will now be discussed, evaluated and its applicability to this particular study will be demonstrated in order to philosophically locate this study.

3.2.6 Interpretivism

Blaikie (2004a) advocates *"the central tenet (of interpretivism) is that because there is a fundamental difference between the subject matters of the natural and social sciences, the methods of the natural sciences cannot be used in the social sciences".* It is not that interpretivists deny the existence of an external reality; it is the notion of an independent knowable reality that they question (Willis 2007). Rather, interpretivists consider research to be influenced and shaped by existing knowledge, theories and world-views. Consequently research has meaning because a group of scholars have agreed on that meaning so research is arguably a socially constructed activity thus, the reality it tells us about is therefore also socially constructed (Willis 2007). Livesey (2012) (p 5) succinctly defined the interpretivist paradigm as being grounded in 3 key-principles:

1. The social world is seen to be produced and reproduced on a daily basis by people going about their lives
2. People actively, if not always consciously or deliberately, create their world
3. The social world is understood by different people in different situations in different ways

The idea of socially constructed meaning is often termed post-positivist because its development was a reaction to the positivist approach to social science inquiry promoting an assumption that individual participants construct social reality (Gall, Gall and Borg 2006). However, Willis (2007) argues that if this individuality is taken too literally the position leads to the problem of other minds as the acceptance of this notion raises the question of how 2 people with unique versions can communicate. Fortunately, most interpretivists argue that the making of meaning is a group or social process. Consequently, humans in groups, such as within the Command and Control frameworks, construct meaning using the tools and traditions of the group such as culture, language, identities, norms and values, and are thus able to share their understanding (Willis 2007).

The interpretivist paradigm broadly speaking can be taken to indicate *"those strategies in sociology which interpret the meanings and actions of actors according to their own subjective frame of reference"* (Williams 2000) (p 210). As this study is focused on collating the personal

views of UK and US practitioners an interpretivist paradigm was adopted. This philosophy was considered as the most appropriate to the stated Aim and Objectives, and for answering the CRQ. This is because the purpose of this study is not uncovering positivistic truth or critical theorist local universal truths. Rather the CRQ was focused on individual perceptions of Command and Control grounded in the language, dialogues and indeed cognitive processes of the sampled participants and the research outcomes constitute a snapshot in time rather than a universal law. This goal necessitated the use of an interpretivist paradigm that was *"predicated upon the view that a research strategy is required that respects the differences between people and the objects of natural sciences and therefore requires social scientists to grasp the subjective meaning of social action"* (Bryman and Bell 2011) (p 17).

3.2.7 The Interpretivist Paradigm and this Study

Through the interpretivist paradigm, the author posits that Command and Control within both UK and US emergency management is essentially a social construct in that its efficiency and effectiveness, when challenged by *"emergencies", "disasters"* and *"catastrophes"* (Quarantelli 2006) is based fundamentally on the shared cognition or lack thereof, of language, norms and values related to personal interpretations of Command and Control. These interpretations are grounded in the relevant legislation, policy, procedure and practice, in both a formal and informal context. Command and Control and interoperability are often reduced to a technological issue, though advances in communications equipment etc can undoubtedly increase capability (Breimyer 2011). However, *"research has tended to focus on the compatibility of the technology and equipment used by responders"* rather than on the actual responders themselves (Cole 2010) (p vii). Consequently, the author was seeking to fill this readily identifiable research gap by developing a deeper understanding of Command and Control based on the views and perspectives of practitioners using the interpretivist paradigm. The resultant study was based on the premise that *"all knowledge, and therefore all meaningful reality as such, is contingent upon human practices, being constructed in and out of interaction between human beings and their world, and developed and transmitted within an essentially social context"* (Crotty 1998) (p 42). That said, at this point it is worth noting that this study, reflecting the author's ontological and epistemological beliefs, does not advocate the more extreme constructivist views that arguably constitute fringe-interpretivism, which for some have almost become a fundamentalist religion (Phillips 1995). However, the author acknowledges the existence of this body of constructivist literature and the interesting contributions of researchers such as Ernest von Glaserfield, Ludwig Fleck, Immanuel Kant, Thomas Kuhn, Jean Piaget and John Dewey. A constructivist or radical constructivist paradigm, which questions or rejects the arguably common sense perspective that some things, such as the laws of physics that keep an aircraft in flight, belong to a *"real world"* of unquestionable objects was considered too extreme for this particular study (Fischer 2003, Phillips 1995).

The constructivist sub-paradigm has some merit in terms of its applicability to the stated Aim, Objectives and CRQ as both approaches stem from the German intellectual traditions of hermeneutics, the verstehen tradition in sociology, from phenomenology, and from critiques of positivism within the social sciences (Gregor 2005). Accordingly, the constructivist paradigm will now be discussed and rejected in favour of interpretivism in order to complete the positioning of this study.

3.2.8 Rejection of the Constructivist Paradigm

"Three baseball umpires are reflecting on their professional practice of calling balls and strikes. The first, a self-confident realist, says, "I call 'em the way they are" to which the second who leans toward phenomenological analysis says "I call 'em as I see 'em", and the third closes the discussion with "they ain't nothin' until I call 'em" (Sarbin and Kituse 1995) (p 1). Sarbin and Kituse (1995) cite this sporting example to highlight the interpretive nature of the constructionist paradigm, which underpins the umpire's view that it (a ball or a strike) does not exist unless he or she calls it, and in calling it he or she assigns meaning to it.

Constructivism is around 30-years old, emerging as a means to come to terms with the nature of reality, its origins come from sociology and it is associated with the postmodern era in qualitative research (Andrews 2012). Articulating and defining the interpretivist and constructionist paradigms is a very difficult task as they are not fully explicit because they do not include a clear set of constructs and assumptions to explain and predict social phenomena: rather, they are instead, a set of ideas and methods that help us to understand social practices at various levels (Jun 2006). These approaches draw their principal energy from a multi-dimensional critique of the positivist paradigm, the constructivist critique emanates from the history of science and sociology of knowledge, and gained breadth and depth through contributions from critical theory, feminism, literary theory, rhetoric and more (Gergen 2001).

Schwandt (2000) (p 197) suggests that garden-variety constructivism might be described in a fairly unremarkable sense; we are all constructivists if we believe that the mind is active in the construction of knowledge arguing that *"human beings do not find or discover knowledge so much as we construct or make it".* Constructionism, similar to interpretivism rejects the notion of objective reality and the centrality of empirical enquiry (Boghossian 2001, Gergen 1995). Constructionism focuses on the development of jointly constructed understanding of the world assuming understanding, significance and meaning are developed collectively in coordination with other human beings rather than individually (Leeds-Hurwitz 2009). It may be argued that a vague conceptual line is all that currently differentiates the constructivist from the interpretivist; they are slightly different rather than fundamentally opposed along paradigmatical lines (Erickson 1986, Jun 2006). Consequently, interpretivism and constructivism are frequently used interchangeably and indeed the *"conventional distinction between ontology and epistemology can often disappear"* although subtle differences actually exist (Guba and Lincoln

1994) (p 111). Crotty (1998) argues that truth and meaning do not exist within an external *"real world"*, but are created by participant's interactions with the world. Therefore, meaning is not discovered rather it is constructed, so participants may understand and make sense of the same phenomenon in different ways, thus constructivism is an epistemological worldview. Furthermore, Crotty (1998) aligns interpretivism with constructivism along theoretical lines suggesting that researchers interested in constructed meaning are influenced by their own theoretical perspective. Thus, constructivism is an epistemology and interpretivism is a theoretical perspective.

Brooksbank (2013) (p 1) argues that *"constructivist researchers believe that we can only explore the realities of individuals as they experience the world, drawing on the interpretations of others whereas, interpretivists believe that humans will consider and analyse what they do, which in turn allows them to make judgements about what they will say and to whom".* Brooksbank's (2013) delineation, although not fully representative of the broad scope of the interpretivist and constructivist literature (Andrews 2012, Berger and Luckmann 1967, Gergen 1985, Gray 2009), serves as a foil that enabled the rationale behind the positioning of this study within an interpretivist paradigm to be clearly articulated.

The author acknowledges that a constructivist paradigm resonates quite closely with the focus of this study, and as such a logical and defensible case for such an approach could feasibly have been made. However, in the context of this study, the participant's knowledge of Command and Control was considered an interpretivist entity based on his/her social interactions with other practitioners. These *"considerations, analyses and judgements"* of individual meaning of Command and Control, rather than shared constructions, are at the heart of this particular study (Brooksbank 2013). Consequently, this necessitated an interpretivist rather than constructivist paradigm as such an approach was more closely aligned with the stated Aim, Objectives and CRQ, and the author's own philosophical beliefs.

The author posits that these interpretations can be more effectively unlocked and mapped through the application of linguistic and visual metaphor methods applied within an interpretivist paradigm (Billups 2011, Lakoff and Johnson 2003, Morgan 2007, Schachtner 2002, Wittink 2011). Hence, an appropriate interpretivist research strategy, which included systems of logic, a sampling strategy and methods for both ethical data collection and analysis, must be defined, and defended. Also, in depth discussion and critique of the chosen methods and the process of how they were applied in the field was necessary to ensure the appropriateness of the research design, and the validity of the methodology. Whilst, also contributing to the achievement of the stated Aim and Objectives by enabling a comprehensive answer to the CRQ to be formed.

3.3 Quantitative vs. Qualitative Methods

To begin the research design process it was logical to contemplate the end-point of the study by considering what the actual research outcomes was likely to be. There are seemingly many kinds of analysis a social researcher can use in order to describe, explain or interpret data; although, in practice options tend to gravitate around the notions of quantitative and qualitative research (Denscombe 2010). The quantitative approach has been the dominant strategy, although its influence has waned slightly since the mid-1980s, when qualitative research became more influential (Bryman and Bell 2011). At its most basic quantitative research can be defined as being concerned with numbers and statistics; it is firmly grounded in an empirical base and typically associated with the positivist paradigm (Bryman and Bell 2011, Burns 2000, Easterby-Smith, Thorpe and Jackson 2008, Henn, Weinstein and Foard 2006).

Qualitative research on the other hand is concerned with developing an appreciation of the underlying motivations that people have for doing what they do, rather than test out given theories (Henn, Weinstein and Foard 2006). The approach developed during the late 1960s and throughout the 1970s, developing from methods of ideology critique and critical hermeneutics in the Hegelian and Marxist traditions (Fischer 2003). It is grounded in the concept of *verstehen*, a form of subjective understanding associated with the German sociologist Max Weber (Burns 2000), and is viewed as central to the rejection of positivistic social science despite Weber's view that the 2 could be united (Elwell 2013). Qualitative researchers believe that as humans are aware of their own behaviour, the feelings, thoughts and perceptions of social research subjects should be central to their inquiries (Burns 2000). As such, the qualitative approach is considered a good fit with both the stated Aim and Objectives, which are concerned with personal interpretations of Command and Control, and the interpretivist paradigm adopted. That said, this study did not adopt a wholly qualitative approach, rather it combined both qualitative and quantitative components in a mixed methods approach (Cameron 2011, Cronholm and Hjalmarsson 2011, Muskat, Blackman and Muskat 2012).

3.3.1 A Mixed Methods Approach

Mixed methods research developed with the earliest social research projects in the 1800s and utilise both quantitative and qualitative techniques (Brannen N.D., Bryman and Bell 2011, Hesse-Biber 2010). This combination of methods *"involves the collection, analysis and integration of quantitative and qualitative data in a single or multiphase study"* (Hanson et al. 2005) (p 224), and should not be confused with the term multi-methods which refers to the mixing of methods by combining 2 or more quantitative methods or 2 or more qualitative methods in a single study (Hesse-Biber 2010). A mixed methods approach enabled the author to develop a greater understanding of the research problem and a better understanding of the

social story in its entirety (Hesse-Biber 2010). Hammersely (1996) cited in Bryman (2011) proposes 3 approaches to mixed methods research:

- Triangulation: this refers to the use of quantitative research to corroborate qualitative research findings or vice versa
- Facilitation: this approach arises when 1 research strategy is employed to aid research using the other research strategy
- Complementarity: this approach occurs when the 2 research strategies are employed in order that different aspects of an investigation can be dove-tailed

It may be argued that the use of a mixed methods approach within this study complemented the interpretivist paradigm in which it was conceived. Since interpretivism is commonly aligned with qualitative approaches it would be logical and indeed defensible for the research design to focus solely on collating qualitative data only as such researchers are primarily seeking non-numerical forms of data (Henn, Weinstein and Foard 2006, Walsh and Wigens 2003). This is generally true; in this instance however, the adopted mixed methods approach employed a weighted summation method to augment qualitative approaches in what can be termed a post-positivist manner in order to engender research synergies by combining both types of data (Fischer 2003, Zardari et al. 2015).

The drivers underpinning this approach were drawn from Hammersley's concepts of facilitation and complementarity, cited in Bryman (2011), rather than triangulation. Although, the quantitative element was significantly lesser than the qualitative it provides an initial empirical base that facilitated complementary qualitative research. This ensured a comprehensive answer to the CRQ, and achieved the stated Aim and Objectives: whilst, providing a logical and reasoned defence of the research design. The following section details the Systems of Logic used and is combined with a more detailed explanation of how the mixed methods blend of quantitative and qualitative approaches was achieved.

3.3.2 Systems of Logic

There are arguably 2 distinct theories pertaining to the nature of the relationship between theory and research, namely deductive and inductive Systems of Logic (Bryman and Bell 2011, Easterby-Smith, Thorpe and Jackson 2008, Saunders, Lewis and Thornhill 2007, Trochim 2006a).

3.3.3 Deductive and Inductive Logic

Deductive logic begins with theory, which is used to explain particular observations i.e. the theory is applied in order to deduce explanations for the data (Henn, Weinstein and Foard 2006). Within the deductive system of logic reasoning progresses from the general to the more

specific, beginning with thinking up a theory about a topic, then narrowing this down to specific and testable hypothesis, and collecting observations to either prove or falsify the said hypothesis (Henn, Weinstein and Foard 2006, Pontzer-Ehrhardt 2011, Trochim 2006a). Deductive reasoning is often associated with the positivist paradigm and termed the scientific or top-down approach (Trochim 2006a). Arguably, it is the commonest view of the nature of the relationship between theory and social research (Bryman 2012).

Inductive logic differs in that it works the other way, moving from specific observations to broader generalisations and theories, and is commonly referred to as the bottom-up approach (Trochim 2006a). *"Contrary to deductive logic, induction moves from a set of observations to a theory, and is at the core of social scientific theory development"* (Henn, Weinstein and Foard 2006) (p 50). Rather than slavishly adhering to one or the other system this study embraced a mixed approach combining the veritable strengths and mitigating the weaknesses of the respective approaches in order to achieve the stated Aim and Objectives. This reflects Bryman and Bell's (2011) (p 14) assertion that *"to a large extent, deductive and inductive are possibly better thought of as tendencies rather than as a hard and fast distinction".*

3.3.4 Strategy to meet the Research Objectives

3.3.4.1 Objective 1: The Literature Review

In the first instance, it was necessary to establish a broad-based understanding and critical in-depth knowledge of Command and Control. This process enabled the author to become immersed in the topic in order to develop the Aim and Objectives, set the CRQ and construct a literature review that clearly demonstrated a knowledge-gap and the *"real world"* need for this study. This process constituted deductive reasoning as a basic hypothesis was set and relevant thematic literature has been critically analysed to identify gaps in the current body of knowledge, to set a valid CRQ (Bryman and Bell 2011, Phillips, Saunders and Thornhill 2006).

3.3.4.2 Literature Review Hypothesis

"Failures in U.K. and U.S. emergency management demonstrate that greater knowledge of Command and Control (amongst other areas) is required"

Traditionally, the construction of a literature review would not normally constitute an element of the overt research methodology. However, in this instance reference to the setting of a hypothesis followed by a process of data collection and analysis confirmed the aforementioned hypothesis and helped develop the CRQ demonstrating the use of a deductive system of logic. It is cited here simply to illustrate the holistic mixed system of logic applied within this particular study.

3.3.4.3 Objective 2: Assess the Relevance of Morgan's Metaphor Theory

The opening element of the field-study employed a weighted summation method (Zardari et al. 2015) to assess the relevance of Morgan's (2007) organisational metaphor theory to emergency management using a deductive system of logic. Although, arguably a positivistic evolution this provided an indication of the applicability of a widely used and accepted organisational metaphor theory across a sample of UK and US emergency management practitioners. This established a base for further inductive research using both linguistic and visual metaphor.

3.3.4.4 Objective 3: Produce Linguistic & Visual Data

Objective 3 may be considered as the main body of the field-study and employed qualitative approaches to collate both linguistic and visual data. Accordingly, it was based upon an inductive system of logic, reversing the deductive process by incorporating observation, detection of a pattern and development of a tentative hypothesis (theory) as a research outcome (Bryman and Bell 2011, Trochim 2006a).

3.3.4.5 Objective 4: Identify Linguistic & Visual Metaphors

This objective was the initial analysis phase. In keeping with the established focus this also embraced a qualitative approach combined with an inductive system of logic to identify linguistic and visual metaphors from within the sampled data.

3.3.4.6 Objective 5: Compare and Contrast the findings to identify Patterns and Trends

Objective 5 was the 2nd analysis phase and used an inductive system of logic to analyse the linguistic and visual data to identify emergent patterns and trends.

3.3.4.7 Objective 6: Develop a Suite of Learning Tools to enhance critical understanding of Command and Control

The analysed findings were then used to inform the development of a suite of learning tools that combined both linguistic and visual methodologies to link theory to practice in a more effective manner, and engender a deeper more critical understanding of Command and Control in order to enhance multi-agency interoperability.

3.3.5 Rationale for using Mixed Systems of Logic

The strategy of mixed systems of logic enabled the formation of a logical and defensible study that comprehensively achieved the stated Aim and Objectives. Ostensibly, this study

constituted a wholly mixed methods approach. However, the primary focus of the study was qualitative induction combined with a smaller element of complementary deduction. This blend afforded the benefits of a preliminarily hypothetico-deductive element to confirm or falsify the relevance of an established theory, namely Morgan's organisational metaphors (Babbie 2013, Denscombe 2010, Henn, Weinstein and Foard 2006, Walsh and Wigens 2003). The inductive element then provided the author the freedom to observe and through a process of metaphorical analysis to develop, and enhance the understanding of the social dimensions of Command and Control as part of a research-then-theory strategy in keeping with the adopted interpretivist paradigm (Babbie 2013, Bryman 2012, Henn, Weinstein and Foard 2006).

3.4 Data Collection Methods

Walsh & Wigens (2003) argue that this section of the methodology should *"outline how the researcher went about the research study"* positing that the *"goal here is to describe the data sources, the data collection tools that were used and the procedures that were undertaken to collect data".* Babbie (2013) points out that *"science is an enterprise dedicated to finding out – no matter what you want to find out, though, there will likely be a great many ways of doing it",* which highlights the broad range of both quantitative and qualitative data collection methods that exist. With these factors in mind, the remainder of this chapter is focused on providing a detailed account, including rationale, of the data collection and analysis methods chosen, rather than engaging in a broad-based critique of all available methods.

The process of selecting appropriate methods was a vital aspect of research design; it is a comprehensive plan for conducting an investigation that stretches from the CRQ through the methods of data analysis, interpretation and reporting, and required thorough consideration of the underlying ontological and epistemological position (Voght, Gardner and Haeffelle 2012). If managed correctly, this process can enhance the study; however, if not, the validity and credibility of the study may be compromised. Bechhofer and Paterson (2001) (p 2) argue, *"while it is relatively easy to generate a research problem, working out how to actually do the research, that is, settling on an adequate research design is much less straightforward"*.

A good research design is one that gives the researcher confidence in the solidarity of the conclusions drawn from the data, and at a level of sordid practicalia, good research design is a good thing because it lets you achieve more and better things for the same effort (Rugg and Petre 2006). In keeping with the adopted interpretivist paradigm, this study embraced a primarily qualitative focus combined with a weighted summation method in order to meet the stated Aim, Objectives and CRQ.

Bechhofer and Paterson(2001) (p 2) state that *"what all researchers ought to aim at is the kind of research design which, once articulated, seems so attractive and obvious as to lead others*

to say I wish I had thought of that" highlighting the significant challenge faced by researchers. Accordingly, the envisaged research design adopted a mixed methods approach, which combined tried and tested as well as experimental methods. These were considered appropriate to the underlying philosophy and CRQ, and may arguably be considered somewhat innovative in terms of their likely attractiveness to other researchers. Consequently, the author posits that the contribution to knowledge forwarded lie not only in the collected data and theoretical outcomes, but also within the research design itself; a claim that will be demonstrated in later chapters.

3.4.1 Surveys, Focus Groups or Interviews?

Qualitative data collection methods are often associated with research conducted within an interpretivist paradigm (Denscombe 2010). Accordingly, a number of relevant methods were assessed and discounted in the early stages of the research design process. 3 methods, namely surveys, focus groups and interviews, were provisionally considered appropriate to the needs of the study.

3.4.2 Questionnaire Survey

In the first instance, the use of the questionnaire survey technique was considered and evaluated. Surveys are not synonymous as there are plenty of other (and often more appropriate) methods that can be used for surveys: and questionnaires in particular are easy to do badly, and difficult to do well (Rugg and Petre 2006). The initial appeal of questionnaires stemmed from the method's simplicity and ability to reach a relatively large sample-frame; they are also one of the most frequently used methods for collecting data (Lavrakas 2004). However, questionnaires, particularly those that are self-administered, need to be simple, easy to understand, clear and easy to complete because no interviewer is available to assist the participant (Phellas, Bloch and Seale 2011). Consideration of these factors in the context of the study's requirements enabled the use of questionnaires to be quickly discounted.

This particular study focused on collating individual perceptions of Command and Control, which prompted the selection of the interpretivist paradigm over the constructivist paradigm. The collation of these individual conceptualisations could have been hampered by miscommunication between participant and researcher. Whilst, individual perspectives are the desired outcomes the use of questionnaires would not have allowed the author to interact directly with the participants, thus if the questions were misunderstood, poorly phrased, in the wrong order or indeed the wrong question, the data obtained may be worse than meaningless, it may be misleading (Brace 2008). The wording of questions is critical as it is relatively easy to influence research participants either negatively or positively, or worse still inadvertently (Iarossi 2006). Consideration of the needs of the stated Aim, Objectives and CRQ identified the requirement for the author to interact with participants, and clarify and probe their individual

responses in order to ensure an accurate and comprehensive understanding of the thick qualitative data sought, in keeping with the adopted interpretivist paradigm (Oppenhiem 1992). Consequently, an alternative method was deemed necessary.

3.4.3 Focus Groups

Following the rejection of questionnaire survey as a viable method other pertinent approaches were considered, namely focus groups and interviews. Prompted by the need for author-participant interaction consideration was given to convening a series of international focus groups to bring together a range of relevant participants in order to discuss their respective views on Command and Control. Focus groups or work-shops as are they are sometimes known consist of a small number of people that are brought together by a moderator, commonly the researcher, to explore attitudes and perceptions, feelings and ideas about a specific topic (Denscombe 2010), in this case Command and Control. Macnaghten & Myers (2002) (p 65) highlight that as recently as the 1990s, "*an academic researcher had to explain, define, and justify the seemingly odd research practice of getting 8 or so people in a room and making them talk for an overhearing tape-recorder: now everyone academic and non-academic alike, thinks they know what focus groups are".* Originating from market research and a few innovative academic researchers in fields such as cultural studies and social policy focus-group use has evolved, arguably mirroring the growth of social science research, into a widely accepted multi and cross disciplinary approach that is seemingly readily accepted within both the academic and wider communities (Denscombe 2010, Macnaghten and Myers 2002). This approach offers the researcher the ability to clarify, probe and collect data from multiple participants at the same time, whilst enabling the study of the ways in which individuals collectively make sense of a phenomenon and construct meanings around it (Bryman 2012). Consequently, on face value focus groups were seemingly an attractive tool for this primarily qualitative research study.

In depth consideration was given to organising and hosting 2 international focus groups, 1 in the UK the other in the US to bring together a sample-frame of relevant practitioners to discuss issues of conceptualising and understanding Command and Control. It may be argued that focus group usage is relatively commonplace in emergency management. For example, the Aston Crisis Centre at Aston University in the U.K. facilitated the *"Emergency Preparedness for the UK"* series of Economic & Social Research Council (ESRC) funded seminars (Shaw 2009) and the *"Command, Control, and Interoperability Center for Advanced Data Analysis (CCICADA) Annual Research Retreat"* is a U.S. Department of Homeland Security (DHS) funded Center of Excellence at Rutgers University (Lubetkin 2014) regularly bring together academics and sometimes practitioners in thematic focus groups to shape and drive research agendas or theoretical debates. These examples demonstrate the applicability of focus groups to disaster research and provide suitable defence for the use of this method. However, the

method ultimately proved unworkable due to ontological and epistemological concerns and what can be termed logistical considerations as will be outlined herein.

Initial planning and research strategy design based on the use of focus groups indicated that locations and suitable facilities would be required to host the 2 focus groups. Consideration was given to bolting these onto current international emergency management conferences. The UK Emergency Planning Society (EPS) Annual Conference (Silesti 2014), the World Conference on Disaster Management (World Conference on Disaster Management 2013) held every year in Toronto, Canada, the Dealing with Disasters annual international conference (Disaster Management Institute of Southern Africa 2014) and the U.S. Federal Emergency Management Agency's (FEMA) annual Emergency Management Higher Education Symposium were all considered. Subject to the acceptance of an abstract each of these events would have provided a suitable location and the necessary supporting facilities. However, foreseeable issues regarding likely participants emerged. These concerns referred to the ability to ensure a range of suitable calibre participants in terms of their experience and qualifications, or indeed that anyone, would actually sign up for a voluntary non-plenary activity. Worse still, the focus group could attract delegates with little or no relevant experience meaning their views and opinions would likely result in misleading or incorrect research outcomes compromising the study. Accordingly, the use of conferences events was rejected and consideration was given to organising and hosting 2 focus groups as stand-alone events. Provisional costing, which included room and equipment hire, international travel for both the author and likely some of the participants, accommodation and subsistence etc indicated that this would not be possible, as focus groups can be costly and time consuming; factors which contribute the rejection of this approach (Denscombe 2010).

Should the aforementioned logistical issues have been overcome, perhaps by securing a research grant etc, a compelling defence for the use of focus groups could have been made by linking the method to the stated Aim, and Objectives. However, in depth consideration of the underlying ontological and epistemological positioning, which embraced the interpretivist, paradigm, raised questions regarding the appropriateness of focus groups. It may be argued that they do not provide the author with an effective mechanism to capture individual views, conceptualisations and perspectives on Command and Control (Denscombe 2010, Macnaghten and Myers 2002). Whilst this method was likely to capture some, but not all, of the required data the likely research outcomes would be more relevant to the constructivist paradigm. Focus groups tend to concentrate on interaction and group consensus rather than individual perspectives, whilst the recordings are prone to inaudible elements affecting the quality of transcription (Bryman 2012). In addition, participants may or may not offer their opinions as proceedings can often be influenced by 1 or 2 dominant people; this dynamic can affect the research outcomes and the data may not reflect the views of all in attendance (Chrzanaowska 2002, Cresswell 1998). The combination of these ontological, epistemological

and logistical concerns regarding the ability of the method to provide the requisite data led to the rejection of focus groups as a feasible research method.

3.4.4 Interviews: Structured, Unstructured or Semi-structured

Fontana and Prokos (2007) (p 9) argue, *"interviewing is one of the most common and powerful ways in which we try to understand our fellow humans"*. Indeed, it may be argued that interviews are perhaps the most commonly used qualitative social science research tool, and often entail 2 relative strangers sitting down and talking about a specific topic (Rapley 2002). Interviews can take the form of mailed or self-administered questionnaires, telephone surveys or face-to-face verbal interchange (Bryman 2012, Fontana and Prokos 2007). At its most basic the face-to-face interchange, referred to herein as an interview, offers the author the ability to interact directly with participants in order to probe and clarify individual responses. This factor, coupled with a rigorous non-probability purposive sampling method alleviated any concerns regarding participant's credentials in terms of their relevant professional experience and qualifications, ensuring that appropriate practitioners were engaged within this study (Andrews et al. 2002). The author posits that face-to-face interviews offered a means to comprehensively achieve the stated Aim and Objectives, meet the data type and capture requirements of the CRQ and to align the research design with the underpinning ontological and epistemological philosophy of the embraced interpretivist paradigm.

3.4.5 Structured Interviews

Interviews can be structured, unstructured or semi-structured (Stuckey 2013). Within a structured interview the researcher asks all participants the same series of pre-established questions with a limited set of responses (Fontana and Prokos 2007). Participants are forced to choose from a range of predetermined structured answers such as yes/no or agree, unsure, disagree and there is generally very little room for variation in response (Fontana and Prokos 2007, Voght, Gardner and Haeffelle 2012). Structured interviewing is often used to gather data from large samples and ensure consistency of response and is commonly associated with quantitative research (University of Strathclyde N.D.). The goal of this style is to ensure that participant's responses can be aggregated and reliability is achieved if the data is stimulated by identical cues (Bryman 2012). Whilst arguably tried and tested the structured approach did not offer the freedom of participant expression required of the CRQ. Also, the approach restricts the much-needed ability of the author to probe and clarify individual perspectives expressed by participants, and was thus rejected as the questions asked control the data elicited by the participant too tightly to meet the needs of the study (Stuckey 2013).

3.4.6 Unstructured Interviews

An alternative to the tightly controlled structured approach is the polar-opposite unstructured interview, which originated from the ethnographic tradition of anthropology (DiCicco-Bloom and Crabtree 2006). Unstructured interviews afford considerable freedom and scope to move the discussion onto topics and areas that are regarded as significant, enabling both interviewer and participant to describe the situation as they see it, and to provide justification and clarification in their own words (Denscombe 2010).

Rather than adhering to a fixed sequence of questions, the interviewer typically prepares an interview guide or aide-memorie of themes and issues that are to be covered during interview (Bryman 2012, Fontana and Prokos 2007). Such an approach is arguably well suited to inductive research as it is an *"extremely useful method for developing and understanding of an as yet not fully understood or appreciated culture, experience or setting"* (Cohen and Crabtree 2008). It is best used when the interviewer wants to find out as much information as possible; the benefit is that information that may not have been uncovered with a more tightly controlled approach can emerge due to the lack of a formal protocol and a more conversational style (Santiago 2009).

Unstructured interviews can sometimes be difficult to focus as although the interviewer develops the guide, the agenda is actually set by the participant through the stories and events they choose to tell or not to tell. Also, the participant maintains control of the pacing of the interview, what will be disclosed in terms of detail and scope, and the emotional intensity (Corbin 2003). DiCicco-Bloom and Crabtree (2006) (p 315) argue that *"no interview can truly be considered unstructured: however, some are relatively unstructured and are more or less equivalent to guided conversations".* These issues can be problematic when seeking to address specific issues or themes, such as the stated CRQ and SRQs, and despite active listening and skilful questioning the interviewer may conceivably not achieve the desired outcomes. As such, the unstructured approach is arguably more suited to exploratory or pure inductive research, which can sometimes be dismissed as academic fishing (Fischer 2003). Although, the research design was inductive in nature it is predicated on the answering of a CRQ to achieve a stated Aim and supporting Objectives, which is why the unstructured approach was considered inappropriate.

3.4.7 Semi-Structured Interviews

The purpose of both semi-structured and unstructured interviews is to discover rather than check information which suggests that both are appropriate to this study: however, the semi-structured approach was preferred over unstructured (Denscombe 2010). This is because the former is considered more appropriate to the achievement of the stated Aim, Objectives and CRQ; the rationale for and defence of this decision will now be made.

The semi-structured approach is a technique often used to collect qualitative data by organising the interview in a way that allows participants the time and scope to talk about their opinions on a particular subject, in this case Command and Control, with the objective being to understand the point of view rather than make generalisations about behaviour (Sociology Central N.D.). The application of this method required a question schedule that employed primarily open-ended questions, some suggested by the author and some that arose naturally during the interview with the built-in flexibility as this enabled the necessary in-depth discussion of the participant's views of Command and Control to take place (Gubrium and Lolstein 2001, Sociology Central N.D.).

The semi-structured approach offered a number of benefits; firstly a positive rapport could be quickly established between author and participant that allowed emerging themes and issues to be probed effectively (Chrzanaowska 2002). Secondly, there was high degree of data validity as participants were able to interpret the questions and talk about Command and Control in depth. So meanings behind actions were revealed as there was little direction from the author and a process of joint construction of meaning was established (Mishler 1986). Thirdly, complex questions and issues could be discussed and clarified enabling a rich and thick picture of the participant's individual views to be achieved (Phellas, Bloch and Seale 2011). Finally, the problem of the author pre-determining what would or would not be discussed was avoided as the participants could and indeed were encouraged to interpret the questions in their own way and direct the discussion how they saw fit (Bryman 2012, Phellas, Bloch and Seale 2011, Sociology Central N.D.). The combination of these factors demonstrated that semi-structured interview use was arguably far superior to both questionnaires and focus groups in this instance.

3.5 The Question Schedule

3.5.1 Setting the Interview Questions

Fontana and Prokos (2007) (p 9) argued, *"asking questions and getting answers is a much harder task than it may seem at first".* Thus, time and consideration is needed to ensure that questions are appropriate to the setting and effective in order to achieve the necessary research outcomes (Voght, Gardner and Haeffelle 2012). Accordingly, a schedule of primarily open-ended questions was developed to ensure that the interview discussion covered the required themes and issues, and to allow the necessary scope for participants to fully express their views and perspectives. The question schedule comprised of 16 open-ended questions and 2 special tasks totalling 18 questions. Questions progressed from the generic to more specific and adopted a thematic approach outlined in Fig 3.1 below (Gill et al. 2008).

Fig 3-1: Question Schedule Focus and Themes
Interview Themes

Primary Focus: Command and Control
Themes: 1. Relevant experiences 2. Personal narratives and system interpretations 3. Purpose and history of Command and Control 4. Visual interpretation task (special) 5. Strengths, weaknesses and improvements 6. Organisational metaphor task (special)

The question schedule included 2 special tasks that were designed to capture unique data relating to the achievement of Objectives 2 and 3. Please note: the relevant objective is outlined prior to the discussion of each Special Task to aid readability and clarity.

3.5.2 Special Task 1 - Empirical Data

Objective 2: *assess the relevance of Morgan's organisational metaphors to U.K. and U.S. emergency management*

Objective 2 was designed to establish through deduction the relevance of Morgan's (2007) organisational metaphor theory within a new field, namely emergency management as a precursor to more in-depth inductive research. As part of the mixed methods approach (Bryman and Bell 2011, Hesse-Biber 2010), this Special Task employed a weighted-summation method (Zardari et al. 2015). Thus, it was designed as a quantitative dip of the toe to demonstrate the relevance or not of a readily accepted metaphor theory within emergency management, rather than as a comprehensive empirical study in its own right. The author posits that the use of a basic ranking and weighted summation method provided appropriate data to successfully achieve Objective 2. However, it is acknowledged that a more comprehensive quantitative method, such as SPSS-based statistical analysis, variance analysis, bivariate or multivariate analysis, could have been used to generate more in depth empirical data (Martin and Bridgmon 2012). However, such empirical depth was simply not required, as at its most basic Objective 2 required a simple yes the theory is relevant or no it is not. Weighed summation (Zardari et al. 2015) goes beyond this in terms of depth, it answered the yes/no question whilst also generating data that effectively illustrated the perceptual differences between the relevance of Morgan's 8 individual metaphors to the sample-frame to comprehensively achieve Objective 2.

To capture the required empirical data participants were asked during interview to rank Morgan's (2007) metaphors in order of their relevance to their personal views of Command and Control. Each participant was given a ranking template (see question schedule) detailing Morgan's 8 organisational metaphors and a list of supporting terms that are readily associated with each given metaphor to ensure an understanding of the concepts. Participants were then

invited to rank as many or as few metaphors as they felt were relevant, and they were encouraged to ask clarifying questions as necessary. An option of selecting None of the Above was also included to allow participants to indicate that none of the metaphors were appropriate to their views.

3.5.3 Special Task 2 - Visual Metaphor

Objective 3: *Produce linguistic and visual data that encapsulates emergency management practitioners' views on Command and Control*

Special Task 2 was designed to induce and capture participant's visual interpretations of Command and Control. During interview participants were provided with a blank template and invited to draw a visual interpretation of Command and Control. No other guidance was given and no restrictions, other than the use of a pen and the provided template limited the participant to ensure that they were free to interpret the task and complete it in whatever manner they saw fit. The outcome was a visual insight into how the participants viewed Command and Control, providing a rich depiction of their individual conceptualisation.

Rose (2001) (p 5) argues, *"over the last 2 or 3 decades, the way in which many social scientists understand social life has shifted".* Arguably, mirroring social science's move away from the positivist paradigm and associated empirical research methodologies contemporary and novel qualitative approaches have emerged including visual social research (Banks 2001). Visual social research is becoming more influential encompassing both found and created images (Banks 2001, Geue et al. 2010, Navarro et al. 2011, Schachtner 2002). *"Visual methods were almost invisible a decade ago: however, this malaise for things visual has been replaced by general awakening to the significance and ubiquity of imagery in lives; visuals are pervasive in public, work and private space, and we have no choice but to look"* (Prosser 2011) (p 479).

Visual metaphor is now commonplace in media and communications research (Haught 2013, Wilken 2013). Print and electronic media outlets routinely employ visual metaphor, for example, portraying disaster through the metaphor of war, and emergency response as a battle within the war (Waugh 2006). However, to date visual metaphor has only tentatively been engaged within disaster research for example in media communications (Tierney, Bevc and Kuligowski 2006) and as a form of post-trauma psychotherapy and illness treatment (Geue et al. 2010). Consequently, there is considerable scope for novel and impactful disaster research using visual methods. Thus, the author posits that this component of the study also constitutes a significant contribution to knowledge in its own right.

Edgar (2004) cited in Pink (2012) (p 234) argues that the *"use of the imaginative senses could be used across the full range of social sciences"* suggesting that *"the mind's inner imagery can be manifested in a number of external forms",* which validates the use of visual metaphor within

this study. The design of this Special Task was intended to be simple as this allowed participants the freedom to express their views through visual means without significant author input or focus on the mechanism of the task.

The use of visual metaphor was inspired by the work of Schachtner (2002) who focused on the application of visual social research methods to develop a rich depiction of how practicing medical doctors come to diagnostic and therapeutic decisions in cases of vague illness and long and complex searches for diagnosis. The approach required doctors to draw a visual representation of the said processes during qualitative interview, and was motivated by a deficit in the status of knowledge of the microstructures of medical practice (Gimmler, Lenk and Aumuller 2002). Schachtner (2002) developed metaphors of illness as cause and effect and health as development from the drawings as they offered a richer and deeper insight into how these processes are conceptualised by practicing doctors. Similarly, the anti-reductionist Soft System's Methodology (SSM), which emerged due to the limitations of hard (mechanistic) systems approaches to solving management problems as stakeholder's views on the nature of the problem, the purpose of the system and indeed the system itself differed, also influenced the research design (Manchester Metropolitan University 2005). Checkland and Wilson developed a soft pragmatic approach using visual techniques to construct a shared conceptual understanding of ill-defined complex problems using rich pictures, which are essentially metaphors (Burge 2015, Manchester Metropolitan University 2005).

The author posits that visual methodologies are powerful and largely untapped within disaster research. They are capable of building rich and detailed images of how participants view key issues. And, for these reasons coupled with the ability to engender depth beyond that which can be expressed through spoken words the inclusion of visual methods was considered a defensible and valuable part of the research design (Pink 2012, Prosser 2011).

3.6 Data Capture Methods

An important aspect of research design was the selection of appropriate data capture methods, as it is essential that the researcher carefully notes and records the necessary data for analysis at a later time (Gill et al. 2008). An effective data capture strategy facilitates collation of useful data for analysis and prevents the loss of valuable information as it is not possible for a researcher to take full notes and conduct an interview effectively: furthermore, comprehensive note-taking would require another person to be in the room (Chrzanaowska 2002). Consequently, a 2-tiered data capture strategy was adopted.

3.6.1 Primary Data Capture Method

The interviews were conducted in a conversational manner and required a data capture method to collate the said discussion with minimal user input and management throughout.

Accordingly, the primary data capture method was a Digital Voice Recorder (DVR) as these units are specifically designed to record voice communications such as meetings, interviews and focus groups etc. (Olympus 2014). Consideration was given to using a smartphone such as the Apple IPhone 4S equipped with the Recorder for IPhone app (Retronyms 2014). However, as this would be a *jury-rigged* approach rather than designed for purpose a more reliable solution was sought. The Olympus VN-711PC DNS Digital Voice Recorder was identified as an appropriate and cost-effective solution as it was a tried and tested system designed to capture one-to-one meetings; this was purchased and tested prior to the field study (Olympus 2014).

As a contingency measure in case of primary system failure before, during or after interview a secondary DVR, an Olympus VN-411PC, was loaned from the Coventry University Resource and Map Library. Each interview was dual-recorded to ensure minimal interruption and risk of data-loss due to a technical failure.

3.6.2 Secondary Data Capture Method

The Question Schedule was designed to guide the progression of the interview discussion. However, an ancillary note-capture component was built into the schedule so each question was allocated a space where notes could be recorded. This process was designed as a secondary data capture method intended to augment the primary recordings by enabling the author to note down any key points, themes or quotes that emerged; please note, this was not intended to provide a comprehensive account of the full interview (Chrzanaowska 2002)

3.7 Sample-Frame Design

The basic principle underpinning sample-frame design is that you can gather representative data and produce accurate and reliable results without surveying the whole of society (Denscombe 2010). There are 2 broad approaches that a researcher can use, namely probability sampling and non-probability sampling (Bryman and Bell 2011). Probability-sampling relies on the use of random selection and is based on a statistical theory relating to the normal distribution of events whereby the researcher has absolutely no influence on the selection of participants to be included within a given sample-frame, and includes simple random sampling, systematic sampling, stratified random sampling and multi-stage cluster sampling (Bryman and Bell 2011, Denscombe 2010, Thompson 2012). Random sampling methods were not considered appropriate due to the highly focused and specific nature of this study. Command and Control is a subset of disaster research, which is in itself is a highly specialist field, and furthermore the stated Aim, Objectives and CRQ clearly relate to the interpretation and conceptualisations held by practitioners. Consequently, probability sampling was rejected from the research design.

This study employed a form of non-probability sampling which is *"essentially an umbrella term to capture all forms of sampling that are not conducted according to the canons of probability sampling"* (Bryman and Bell 2011) (p 200). There are 3 main types of non-probability sampling, namely quota sampling, convenience sampling and snowball sampling (Bryman and Bell 2011, Denscombe 2010). The research design incorporated elements of both convenience and snowball sampling in a purposive sample-frame, which is *"where the researcher selects what he/she thinks is a "typical" sample based on specialist knowledge or selection criteria"* (Bryman 2012, Walliman 2006). This approach was necessary to ensure that appropriately qualified and experienced practitioners were engaged within the field-study; which provided the guiding rationale behind the research design.

3.7.1 The Country Sample-Frame

At the outset of this study a global focus was envisaged. The initial country sample-frame incorporated 5 nations: namely, Australia, Canada, Russia, the United Kingdom and the Unites States of America. However, this was cropped to 3 as a preliminary feasibility study concluded that the resources likely to be required to conduct field-research in Australia and Russia would greatly outweigh those available. Furthermore, in the case of Russia, an expected language barrier and foreseeable difficulties in accessing relevant organisations and personnel exacerbated these concerns.

Canada was then also removed following early literature-based research, and a face-to-face meeting with Dr Ali Asgary, an acknowledged expert in Canadian emergency management, at York University in Toronto, Canada on 9th December 2010. Dr Asgary confirmed the researcher's literature informed view that considerable similarities exist between the Canadian and US Command and Control systems which reduced the value of including both countries within the study (Public Safety Canada and U.S. Department of Homeland Security 2012). The reasons for this similarity of approach include close geographic proximity and well-established reciprocal emergency management relationships meaning that Canadian views and perceptions were likely to be similar to that of their American counterparts. This limited the perceived benefits of a separate Canadian research evolution (Asgary 2010).

This narrower geographic focus allowed field-research to be conducted in both the UK and the US as projected expenditure was within the resource limits available. Thus, the geographic focus of the study centred on a bi-lateral study of perceptions of Command and Control held by emergency management practitioners in the UK and US. Furthermore, this 2-country research design was also ratified in email discussion with Professor David McEntire at the University of North Texas, during which Professor McEntire indicated that comparative studies between Command and Control systems in different countries were uncommon (McEntire 2008), and indeed the literature notes that comparative studies more broadly are also somewhat limited (McEntire and Mathis 2007, McEntire 2010).

3.7.2 The Emergency Management Organisational Sample-Frame

Similarly to the identification of appropriate countries for research purposes, initial thinking regarding the organisational sample-frame foresaw the inclusion of a wide-range of relevant stakeholders within this study. Those participants considered at the outset included relevant academic and community representatives, as well as practitioners. However, as a large sample-frame is not necessarily required by the adopted interpretivist paradigm, as these are more readily associated with the positivist paradigm and its need for greater accuracy of generalisations identified through numerical measurement, statistical analysis, and the search for cause and effect, a more practical sample-frame was necessary (Holloway and Wheeler 2002). The adopted sample-frame must also address the needs of the stated Aim, Objectives and CRQ, whilst also being manageable given the available time and resources (Bryman 2012, Denscombe 2010).

The UK Civil Contingencies Act (H.M. Government 2004b) provided a defensible organisational sample-frame given the author's UK emergency management background. This is because the Act clearly defines categorised emergency responder organisations. A sample-frame based on these UK organisations combined with their US counter-parts would be logical and defensible. However, the Act identifies 15 core and 13 co-operating agencies, totalling 28 organisations (H.M. Government 2004b). Though defensible, the inclusion of 28 UK and 28 US organisations, totalling 56 participating organisations, was considered impractical as the resources likely to be required to conduct rigorous field-research on such a scale were greater than those available, and the resultant data would go far beyond the needs of the Aim and Objectives, and the actual task. Consequently, it was a necessary step within the research design to reduce the organisational sample-frame to a manageable level. Whilst, also ensuring the study maintained appropriate organisational breadth to ensure the richness of collated data and the validity of the studies research outcomes. To achieve these goals it was necessary to consider and purposively select relevant organisations to achieve the stated outcomes.

3.7.3 Narrowing the Organisational Sample-Frame

It may be argued that a traditional perspective on emergency management would view the Ambulance, Fire, and Police services as the key emergency management organisations in any given scenario, certainly within the UK context. Indeed, it is a logical assertion that the British public would concur with such a perspective on account of the centrality of these organisations within UK emergency management, and their day-to-day visibility within local communities (H.M. Government 2004a, H.M. Government 2013f). The US context is arguably similar with the local Police and Fire Departments providing the traditional first-response, although there are some subtle geographical differences. Firstly, in most locales US Fire Departments generally fulfil the Paramedic and Emergency Medical Technician roles undertaken by UK Ambulance services, as well as the traditional roles associated with UK Fire services: although,

there are independent Emergency Medical Services (EMS) within various states and municipalities that are similar to UK Ambulances services (Medic 911 2014, New York City Fire Department 2003). Secondly, the UK Civil Contingencies Act (2004) mandated Local Resilience Fora (LRF) provide an essentially single-tiered localised organisational framework within which emergency management is organised, and then augmented by national resources as required (H.M. Government 2004a, H.M. Government 2013a). Whereas, in the US there is a multi-tiered organisational framework, which means that emergency management is facilitated by Regional, County and/or State level organisations, and augmented by Interstate and Federal resources, and these arrangements often differ from State to State (Massachusetts Department of Fire Services 2005, National Emergency Management Association 2014a). However, despite these structural differences a workable and defensible organisational sample-frame that aligns comparable organisations across both countries was constructed.

The first step in constructing a workable organisational sample-frame was reducing the range of stakeholders engaged by including only emergency management practitioners. This step sufficiently narrowed the scope to a manageable level, allowing due focus without compromising the appropriateness and validity of the study. Certainly, the inclusion of both academic and community participants, as initially envisaged, would have added considerable depth and richness as their views on Command and Control would extend our understanding of often marginalised groups within emergency management. Consequently, these stakeholders remain ideal candidates for future research. However, in this case their omission was a necessary step to ensure that the scope remained achievable and manageable given the available resource base, though the sample-frame remained rather novel providing a thick richness of data.

3.7.4 Setting the Number of Organisational Participants

When considering the required number of participants from each organisation to be engaged within the field-study it was a prudent step to reflect on the underpinning interpretivist paradigm. This advocates rich qualitative data, non-generalisable outcomes and depth of enquiry meaning a lesser number of thorough interviews was preferable to a greater number of more superficial ones (Gill et al. 2008, Hacking 1981, Saunders, Lewis and Thornhill 2007). Accordingly, 3 experienced practitioners from each of the organisations outlined below were invited to participate is a series of semi-structured interviews that constituted the field-study. This series included 1 pilot, and 15 interviews in the UK and the US respectively, totalling 31. Related studies by Neal and Webb (2006), Chang (2015), Carr and Jensen (2015) conducted 28, 28 and 21 interviews respectively so the total of 31 was considered appropriate.

The selection of 3 participants per organisation was considered defensible as it was in keeping with the adopted interpretivist paradigm. This study was not primarily concerned with empirical validity and generalisation, more readily associated with the positivist paradigm; rather it was

focused on the collation of individual perspectives and interpretations of Command and Control (Aiken 1956, Kolakowski 2004, Kuhn 1996). So the 31 interviews were designed to induce data sets that encompass individual conceptualisations, and though generalisation was not a stated objective, the inclusion of 3 participants per organisation allowed for organisationally specific views to be triangulated adding an element of depth to the analytical process (Denscombe 2010).

Research methodology is often concerned with validity and the reliability so maverick perspectives, which are those that an individual may believe, are representative of their organisation but are actually personal views, are sometimes belittled and dismissed as a negative commodity (Bryman and Bell 2011, Mishler 1986). However, the author posits that such views were actually of critical interest to this interpretivist study, which was focused on the individual perceptions of Command and Control. Indeed, the stated inductive approach was established on the premise that the author was seeking to establish, rather than confirm or falsify theory so maverick perspectives and those that demonstrated shared organisational traits are equally valid and of interest. This assures that the selection of 3 participants per organisation was logical and defensible (Henn, Weinstein and Foard 2006, Trochim 2006a).

Fig 3.2 below outlines the organisational sample-frame used within this study. It is split into 4 tiers: which includes a pilot interview, which will be discussed later, and comparable local, sub-national and national organisations drawn from across both UK and US emergency management.

Fig 3-2: Organisational Sample-Frame

Level	**Country**	**Organisation**	**NoP**
Pilot	UK	Professor (Emergency Management)	1
National	UK	Civil Contingencies Secretariat Resilience & Emergencies Division	3
	US	Federal Emergency Management Agency	3
Sub-National	UK	Local Authority	3
	US	State Emergency Management Agency	3
Local First Responders	UK	Ambulance Service Fire & Rescue Service Police Service	3 3 3
	U.S.	EMS Service Fire & Rescue Service Law Enforcement	3 3 3
Totals:	2	N/A	31

3.7.5 National Participants

The UK Central Government's emergency management legislation, policy and guidance is implemented by the Civil Contingencies Secretariat (CCS) which is part of the Cabinet Office, and support to local organisations is facilitated through the Resilience and Emergencies Division (RED), which is part of the Department of Communities and Local Government (DCLG) (H.M. Government 2013g). Similarly, in the US, the Federal Emergency Management Agency (FEMA) undertakes a comparable role, on behalf of the US Federal Government, by supporting State and sometimes Local or and/or Tribal Governments to implement federal emergency management legislation, policy and guidance, and also to secure funding by way of grants to improve emergency preparedness (Federal Emergency Management Agency 2014a). These organisations are central to emergency management within their respective countries, and logically form the national component of the organisational sample-frame.

3.7.6 Sub-National Participants

The emergency management functions performed by UK Local Authorities and US State Emergency Management Agencies are markedly similar, though they are not identical. These organisations are compared and contrasted within the literature review, which evidences the decision to align these comparable organisations to form the sub-national tier of the organisational sample-frame.

3.7.7 Local First Responder Organisations

The Local First Responder tier of the organisational sample-frame comprised of representatives drawn from Ambulance/Emergency Medical Services, Fire services and Police/Law Enforcement agencies within the 2 respective countries. These organisations are at the heart of emergency management activities on a day-to-day basis, and they were selected because of the central roles they undertake before, during and post disaster.

3.8 Access to the Field

To build upon the sampling strategy it was necessary to recruit individual participants that were suitably experienced and qualified to ensure, as far as was practicable, the quality and reliability of the data collated (Bryman 2012). Participants from the outlined organisations were purposively recruited for interview based of their role and their practitioner knowledge of Command and Control within their respective countries (Chang 2015, Jensen 2009, Teddie and Yu 2007). However, as emergency management is sometimes a notoriously secretive and overly classified field an access strategy was developed and implemented prior to the field-study to ensure suitable participants could be engaged (O'Brien 2006).

Saunders et al (2007) (p 169) states that *"the researcher's ability to collect both primary and secondary data depends on gaining access to an appropriate source or sources where there is a choice"* as such the development of an effective access strategy was a necessary component within the research design. This study adopted a 3-tiered access strategy, as although a singular project, access was required in 3 distinct phases and 2 countries. Step 1 required secondary data to support the development of the initial Aim, Objectives and CRQ, and to inform the literature review. Step 2 and 3, the UK and US field-studies respectively required the collection of primary linguistic and visual data: however, despite this similarity each needed an individual access strategy due to their distinct organisational, geographical and political environments.

Physical access or entry to the field was the first step in securing the necessary information, and whilst the internet has undoubtedly made accessing much secondary and primary data physical access can still be problematic (Gummesson 2000, Saunders, Lewis and Thornhill 2007). The author as a former UK practitioner with over 10 year's experience has a distinct advantage over the pure-researcher in that existing networks and contacts were used to augment the purposive recruitment process within the UK (Denscombe 2010). However, within the US a proactive snowball process combined with the ethical use of gatekeepers to facilitate access to relevant organisations and individuals was required (Bryman and Bell 2011, Denscombe 2010, Walliman 2006). The phased strategy to secure the necessary access is outlined below.

3.8.1 Step 1 – Secondary Data Access

Secondary data to support the development of the Aim, Objectives and CRQ and the creation of a credible literature review to establish the CRQ was gathered from publically available virtual and physical resources. Virtual resources were accessed via the internet; credible and reliable sources including academic, organisational, governmental and non-governmental web sites were consulted. The electronic library portals at Coventry University, Durham University, Northumbria University, the University of Delaware and the University of South Wales, and Google Scholar were used to access online academic resources. Relevant text-books, and academic and practitioner journals, primarily accessed through the Scopus, Web of Knowledge and Web of Science data-bases, international and national legislation, guidance, policy, procedure and practice, including After Action Reports and Debrief documents were consulted to build a comprehensive picture of the state of the art of UK and US Command and Control. This was then used to inform the development of the literature review, the CRQ and the SRQ framework.

3.8.2 Step 2 – Primary Data Access – UK Field-Study

The construction of the UK participant list was based on a purposive sampling process that incorporated some convenience traits in that the author utilised existing UK networks and contacts to arrange the schedule of 15 face-to-face interviews (Bryman 2012). Participants from local first responders were recruited from organisations based within the North East of England, as this was convenient as access was already in place through well-established professional relationships. Each participant was known to the author and was selected based on their organisation, role within said organisation, and knowledge and experience of working within Command and Control. These participants also had experience of working at Gold (Strategic), Silver (Tactical) and Bronze (Operational) levels of command to ensure, as far as practicable, a broad range of perspectives and experiences of Command and Control.

National and sub-national level participants were recruited using the same base criteria, though as discussed in the literature review, these practitioners generally operate at the Gold (Strategic) and national levels of command only by virtue of their designated role within the UK Central Government's Concept of Operations framework (H.M. Government 2013a).

3.8.3 Step 3 – Primary Data Access – US Field Study

A field-study can involve *"participating in the everyday life of the field"*, in the general sense it describes the activities that take place within the field over the medium and long term (Bechhofer and Paterson 2001) (p 91). However, emergency management is in some senses an insular and heavily restricted field often accessible only to those that *"need to know"* (Comfort 2005, O'Brien 2006). This presented a significant challenge in terms of author access within the US, which required formal permission to be granted through the management of the respective organisations (Saunders, Lewis and Thornhill 2007). The need to negotiate and secure access to US practitioners was identified as a significant barrier to the overall success of the study very early on. Accordingly, it was necessary to identify a number of US *"gatekeepers"* and develop professional relationships that would be able to grant access to secondary data that may not be readily available to UK-based researchers, and to assist with the process of identifying and securing suitably experienced and qualified participants (May 2011). Initial activities included the writing of formal email and letter requests for access to the US Federal Emergency Management Agency (FEMA) Public Affairs Division in Washington D.C. and, email and telephone contact with various FEMA Regional Headquarters across the US (Federal Emergency Management Agency N.D.). However, these requests were unsuccessful resulting in numerous polite refusals and the receipt of the occasional FEMA brochure and pen in the mail. Echoing the words of Hannibal who said *"aut viam inveniam aut faciam"*, meaning *"I will either find a way or make one",* when his generals told him it was impossible to cross the Alps by elephant the author sought an alternate route in (Latin Language Phrases 2009).

3.8.4 Local and State Level Access

In November 2009 the author travelled to New England on holiday. During this trip informal contact was made with the Maine Emergency Management Agency. Subsequently, the author was invited to meet with Rob McAleer, the (now retired) Director of the Maine Emergency Management Agency (MEMA) in Augusta, Maine (Maine Emergency Management Agency 2014). The informal meeting included a tour of the MEMA Headquarters and Emergency Operations Center (EOC), introductions to key Division Directors, and a 1-to-1 with the State Director. This meeting was essentially a 2-hour unstructured interview on emergency management covering local, state and federal activities, along with an in-depth discussion of the US Command and Control system and comparison of the UK approach (Corbin 2003, Fontana and Prokos 2007). Though not formally part of the field-study, this interview provided valuable data to inform the development of the literature review, and also helped to enhance and contextualise the author's understanding of the everyday life of US emergency management (Bechhofer and Paterson 2001). Additionally, the State Director agreed to act as a *"gatekeeper"* and facilitate access to US Federal and local first responder organisations.

3.8.5 Federal Access

The relationship with the State Director and the Division Directors developed throughout 2010 and 2011, as access is a continual task, which needs to be carefully managed (Feldman, Bell and Berger 2003). MEMA staff provided regular insights and updates; answering questions related to US emergency management via email, though the author took care not to abuse this privilege with overly frequent contact. This support was invaluable in shaping the study and it also enabled a snowballing effect that gradually secured access to both federal and local organisations via MEMA over a period of time (Bryman and Bell 2011, Denscombe 2010).

The State Director established contact between the author and the FEMA Acting Regional Administrator Paul Ford and the (now retired) Federal Preparedness Coordinator Russ Webster based at the FEMA Region One Headquarters in Boston, Massachusetts. This subsequent email dialogue led to an invite to visit the Region One Headquarters for research purposes, subject to background and security vetting which was duly passed.

In January 2012 the author undertook a 2-week self-funded research placement intended to develop a working knowledge of US federal emergency management activities, and also to identify and secure federal participants for interview within the field-study. The author was based under Russ Webster, the Federal Preparedness Coordinator, at the FEMA Region One Headquarters in Boston, Massachusetts. Access to senior leadership was granted, which enabled the author to approach the Regional Administrator, Division and Branch Chiefs and other specialists as necessary in order to collate the pertinent information and gain an insight into the day-to-day activities of the different branches and divisions within the organisational

structure (Federal Emergency Management Agency 2014b). Opportunities were provided to shadow key-senior staff such as the Grants, Response and Recovery Directors and the Hazard Mitigation and National Preparedness Branch Chiefs to allow an insight into their activities (Bartkowiak-Theron and Robyn-Sappy 2012, McDonald 2005). Also, participant observation of internal Department of Homeland Security briefings, multi-agency and in-state meetings and training activities was encouraged, and access to the highly-sensitive Regional Response Coordination Center (RRCC) was provided to maximise learning opportunities, along with on-going contact to the necessary federal participants (May 2011, Wadsworth 2011).

3.9 The Interview Procedure

Yoland (2011) (p 67) suggests, *"an interview is simply a face-to-face meeting in which two people have a conversation".* However, Denscombe (2010) (p 243) argues that *"interviewing is no easy option; it is fraught with hidden dangers and can fail miserably unless there is good planning, proper preparation and a sensitivity to the complex nature of interaction during the interview itself".* Seemingly, a research interview is more than a straightforward conversation, though a conversational approach can be adopted, any superficial similarity between an interview and a conversation must be ignored to prevent the illusion of simplicity (Denscombe 2010). At its most basic an interview is when the interviewer asks a specific question, the participant gives some form of answer and the pattern repeats itself until either the interviewer or participant says thank you and the interview ends, which doesn't really sell interviewing as a viable method (Rapley 2002). However, in-depth interviews encourage thick description induced by questions and other verbal and non-verbal methods to produce detailed answers (Rapley 2002). Accordingly, the research design adopted an in-depth interview style that embraced a conversational tone within a semi-structured format. This strategy allowed the author to probe and clarify answers, whilst affording participants the freedom to express their views and perspectives freely; taking whatever time they needed (Currivan 2008).

3.9.1 The Interview Locations

Voght (2012) (p 157) suggested that the researcher must *"decide if the [interview] location is a variable or a constant"* and *"think about the contexts in which people will be willing to be interviewed".* The interview locations were variable by necessity as it was not always possible to predict where and when an emergency may happen, and practitioners were obliged to respond at moment's notice. Accordingly, the author adopted a flexible approach that, subject to the Health and Safety risk assessment, allowed for interviews to be scheduled at times and places that were most convenient for participants. This included early-mornings and night shifts as well as standard office hours to allow interviews to be scheduled during quieter operational periods when the probability of an incident occurring was less likely.

Herzhog (2005) (p 25) argues *"interview location plays a role in constructing reality, serving simultaneously as both cultural product and producer. Thus, the choice of interview location (who chooses and what place is chosen) is not just a technical matter of convenience and comfort".* With this in mind, though variable the interview locations shared some commonality. Firstly, the locations were office-type environments that were relatively quiet and known to the participants to ensure, as far as was practicable, that they were relaxed and comfortable as establishing a rapport with a single participant can be challenging, especially if there is no prior relationship (Brewer and Williams 2005).

The UK interviews took place within offices located at Ambulance service Headquarters, Fire service Headquarters, Local Government City and County Halls and Police Constabulary Headquarters located in the North East of England, and at the Cabinet Office Civil Contingencies Secretariat (CCS) in Central London. The author scheduled the 15 interviews directly with the participants, and they took place between August 2012 and September 2013.

The US field study was conducted in 2 locations within New England and they took place during a more compressed time frame due to resource and practical limitations that precluded numerous trans-Atlantic trips to conduct single or a few interviews at a time. Rather, the federal and state *"gatekeepers"* arranged and hosted the respective interviews during July 2013. As such, the 3 federal interviews took place at the FEMA Region One Headquarters in Boston, Massachusetts, and the 3 state and 9 local first responder interviews took place at the Maine Emergency Management Agency (MEMA) Headquarters in Augusta, Maine. The 2 field studies were scheduled in different ways though, as research design often requires practical compromises to account for resource constraints this approach was defensible as it met the needs of the Aim and Objectives (Bryman and Bell 2011, Denscombe 2010, Easterby-Smith, Thorpe and Jackson 2008, Saunders, Lewis and Thornhill 2007).

3.9.2 Building a Rapport

Establishing a rapport was necessary to encourage the respondent to want or at least be prepared to participate in and persist with the interview, and this can be challenging especially if the researcher is unknown (Brewer and Williams 2005, Bryman 2012). A rapport was relatively easy to establish with the UK and the US federal and state participants, as the author was known. However, this was not the case with the US local first responders so steps were taken to quickly establish a rapport to allow honest and open dialogue to take place.

Gordon and Robson (1982) (p461) cited in Chrzanaowska (2002) (p 76) warn that "*even skilled interviewers convey more than they perhaps wish, by body language, that is, non-verbal cues. The problem this can create – respondent resentment, distrust, posturing – are greater than those created by interviewers' misuse of verbal communications"*. As such, steps were taken to control the balance of power within the interview and ensure a positive rapport was

established. The author presented himself as being there to learn, whilst also demonstrating by suggestion that he was also an experienced practitioner. This approach was useful in dealing with senior practitioners who have specialist knowledge and could be offended or impatient to be confronted by someone seen to be of limited experience and knowledge (Chrzanaowska 2002). Accordingly, a brief synopsis of the author's credentials was included in the Participant Briefing Note (see Appendix 4) and was forwarded to all participants 2 weeks before each interview. This subtle strategy assisted in developing a rapport and minimise the need for and potentially negative effect of researcher self-promotion by establishing common ground before rather than during the interview. Positioning the author as an experienced veteran and fellow practitioner, one of *"us",* rather than an external academic ensured that the participants were comfortable discussing and expressing their personal views on Command and Control in their own formal and informal specialist language, which was at the heart of this study (Chrzanaowska 2002).

This approach balanced the power within the interviews, placing the author on an equal footing, and allowing the interview to be effectively managed within the semi-structured format as too great a rapport may have caused interviews to go on too long, and too little could have resulted in limited data being collated (Bryman 2012). Care was also taken to ensure any leading of the participant was for clarification of questions to minimise the likelihood of false answers (Brewer and Williams 2005, DiCicco-Bloom and Crabtree 2006). Also, ensuring that the author was appropriately dressed to maximise the likelihood of a positive reception augmented this rapport development strategy.

3.9.3 Researcher Dress

The author adopted a smart-casual dress code by wearing trousers and a polo shirt with the logo of a relevant professional organisation, either Coventry University or the International Association of Emergency Managers, as this is the generally accepted non-operational dress within the field. A suit and tie was considered inappropriate, as it is too formal. Such dress is also often associated with senior leadership in emergency management organisations, and is perhaps not conducive to engendering open and honest conversation with operational personnel (Robinson 2014, Webster 2011). Similarly, denim jeans and a tee shirt were deemed too informal and somewhat unprofessional; as first impressions count so the combination of a polo shirt and trousers offered a happy medium between the formal and informal that was appropriate to the environments in which the interviews took place (Bateman and Mawby 2004).

Fig 3.3 below outlines the sequence of activity within the interview process

Fig 3-3: Interview Process Time-Line		
No	**Activity**	**Purpose**

1.	Send Welcome Letter & Briefing Note (2 weeks prior)	Participant awareness
2.	General Welcome & Introduction –	Positioning the researcher as an *"experienced practitioner"*
3.	Commence dual recording	Data capture
4.	Verbal review & agreement of: • Interview Data Capture Policy • Data Protection Assurance • Right of Withdrawal	Ethical compliance
5.	Signing of 3 consent documents covering the above policies	Ethical compliance
6.	Question based discussion with hand-written note-taking (60-70 minutes)	Data Capture
7.	Empirical Ranking of Morgan's Metaphor (5 – 10 minutes)	Data Capture
8.	Review, *"anything to add"* & close (10 mins)	Data Capture
9.	DVR data capture check	Data Capture

The semi-structured nature of the research design necessitated a flexible approach to interview length so 60 to 90 minutes were allotted. However, the author was keen to afford participants the verbal space and freedom to express their views in as few or as many words as they deemed necessary, so flexibility was built into the interview schedule and communicated to the participants (Gubrium and Lolstein 2001, Mishler 1986). This approach afforded the participants a level of control over the interview, though there was an associated risk that proceedings could go on longer than anticipated (Bryman 2012). However, as this was an inductive study and the collation of rich thick qualitative data was a key research objective this risk was considered acceptable. Any negative impacts were mitigated through appropriate management of the rapport. Careful probing of the participant by asking another focused question or using a form of responsive encouragement was often more productive, and ensured that the author was generally able to direct proceedings without compromising the richness of the data or causing offence to the participant (Chrzanaowska 2002, Seale and Gobo 2002).

3.9.4 The Pilot Interview

Voght, Gardner and Haeffelle (2012) advocate that ample time and consideration should be given to developing the question schedule to ensure that it is appropriate to the study, and to the environment in which it will be used. Bechhofer and Patterson (2001) (p 56) caution that *"no one ever became a competent interviewer, let alone a really good one by reading books alone"*, highlighting why piloting is so essential. Accordingly, this study incorporated a pilot

interview to validate the administration, question schedule design and process to maximise the likelihood of success (van Teijlingen and Hundley 2001).

An eminent Professor from an external university with considerable proficiency in emergency management research and a substantial track record of publication was engaged for the pilot. Please note: the Professor's name and university have been omitted to ensure anonymity. The pilot interview was conducted in accordance with the stated research design; data was captured, though not included for analysis, and to test the equipment. Feedback was sought on all aspects of the process to identify flaws, limitations, or other weakness within the research design, and all necessary revisions were made prior to commencement of the field-study (Turner III 2010). Fig 3.4 below outlines the areas validated and amendments that were made following the pilot interview.

Fig 3-4: Pilot Interview Activity Validation		
No	**Activity**	**Validated or Revision**
1.	Welcome Letter & Briefing Note	Validated
2.	General Welcome & Introduction –	Validated
3.	Dual recording process	Validated
4.	Verbal review & agreement of policies	Validated
5.	Informed Consent documents (three)	Simplified & reduced to 1 document
6.	Question based discussion	Minor re-ordering of questions 1-9
7.	Empirical Ranking of Morgan's Metaphor	Validated
8.	Review, "anything to add" & close	Validated
9.	DVR data capture check	Validated

3.10 Analysis Methods

The qualitative researcher is seeking to understand the world of the participants through analysis and interpretation of the collated data (Ereaut 2002). A comprehensive and defensible research design requires not only strategies for collecting the required data, but also ones for analysing data as this ensures the credibility of the research outcomes. Analysis provides a means to break data into parts in order to inspect and understand it (Empire State College 2014). Trochim (2006b) argues, *"by the time you get to the analysis of your data, most of the really difficult work has been done. It's much more difficult to: define the research problem, develop and implement a sampling plan; conceptualise, operationalise and test your measures; and develop a design structure. If you have done this work well, the analysis of the data is usually a straight forward affair".* This perspective does not advocate that analysis is either a simple nor easy task. Indeed, it is a vital element of the research design process and similarly

to the data capture methods; the selected analysis methods should be congruent with the underpinning research philosophy, Aim, Objectives and CRQ (Halcomb and Davidson 2006).

3.10.1 Weighted Summation

The collated empirical data was analysed in order to achieve Objective 2, which endeavoured to *"assess the relevance of Gareth Morgan's organisational metaphors within U.K. and U.S. emergency management".* This process utilised a weighted summation method, which is outlined below (Zardari et al. 2015):

3.10.1.1 Empirical Analysis Step-by-Step Process

1. Individual rankings were coded into country and organisational denominations to ensure participant anonymity

Fig 3-5: Organisational Coding Strategy		
Country	**Organisation**	**Code**
UK	Ambulance Service	A
	Central Government	CG
	Fire & Rescue Service	F
	Police Service	P
	Local Government	LG
US	Emergency Medical Services	E
	Federal Government	FE
	Fire & Rescue Service	FR
	Law Enforcement	LE
	State Government	S

2. Individual rankings assigned codes in a Microsoft Excel spread sheet

3. A weighting mechanism assigned to each rank (see Fig 3.6 below)

Fig 3-6: Weighting Mechanism	
Rank	**Weighting Score**
1	10
2	8
3	7
4	6
5	5
6	4

7	3
8	2
None of the Above	0

3.10.1.2 Analysis Logic Sequence

A logic-sequence containing 3 elements was constructed to enable the analysis of the rankings data set, this included:

1. A codified and conditional formatted table illustrating the UK data
2. A codified and conditional formatted table illustrating the US data
3. A weighted summation calculations table for the combined, UK and US data sets

The purpose of this 3-pronged approach was to enable the over-arching trends to be identified in the first instance. This offered a general indication of the perceived relevance of Morgan's metaphors to emergency management to the overall sample, the individual UK and US data sets respectively. The outcome of this process was a primary investigation of the collated empirical data to identify the perceived relevance of Morgan's metaphor at the stated 3 levels, namely combined, UK and US. The findings drawn from this research component achieved Objective 2 by illustrating similarities and differences in the ways in which participants viewed Command and Control through the lenses provided by Morgan's organisational metaphor theory.

3.10.2 Content Analysis

The purpose of the interviews were to collate thick qualitative data for metaphorical analysis. However, first it was necessary to contextualise the data. As such, content analysis was selected to make sense of the data and provide much needed thematic context prior to the more focused metaphorical analysis. Content analysis involved comparing and contrasting sections of the interview transcripts that are linked to the same idea or concept, and are thus given a code (Gibbs 2007). In this case, the inclusion of this method was a vital layer of analysis, and a critical supporting tool that provided the context to achieving Objective 3. A synopsis of the adopted process is outlined in Fig 3.7 below:

Fig 3-7: Content Analysis Process	
1.	Read and annotate the interview transcript
2.	Review the notes and list the themes found
3.	Read the list and categorise the themes with a description
4.	Identify links between themes and categorise them as major or minor
5.	Compare and contrast major and minor themes

6.	When all transcripts are reviewed collect all themes and ensure they fit and are relevant
7.	Review major and minor themes to see if any themes need to be merged or sub-categorised
8.	Return to transcripts to ensure nothing has been missed
Source: (Burnard et al. 2008, Neuendorf 2002, University of Surrey N.D.)	

3.10.3 Metaphorical Analysis

Metaphor is arguably a well-recognised academic concept by which humans make sense of the social world around them, and also as a tool to convey deeper meaning beyond the literal to others (Lakoff and Johnson 2003, Ortony 1998). For example, phrases such as *"traffic was murder*" or *"I really got on top on my workload"* abound within many social and organisational contexts. The intended meanings behind these phrases are seemingly readily understood: however, examination of the literal and contextual meanings of these terms, murder and top uncovers significant differences. The literal meaning of murder is the unlawful premeditated killing of one human being by another, whereas top refers to the highest or uppermost point, part or surface of something. When examined closely, neither of these literal definitions directly relates to the contextual meaning being communicated by the speaker or indeed the cognitive understanding acquired by the listener or listeners upon hearing such phrases. Comprehension of deeper meaning beyond the face value of the linguistic terms in isolation is achieved through the transferral of metaphorically based understanding and cognition of mutually understood ideas, which illustrates the communicative power of metaphor in the linguistic sense.

3.10.3.1 Linguistic Metaphor

The etymological origins of the English word metaphor can be traced back to the 16th century old French word *metaphore*, which comes from the Latin *metaphora* and translates as carrying over; this is drawn from the much older Greek word *metaphora*, which means to transfer (Arduini 2007). In the modern sense the term metaphor is *"a word or phrase applied to an object or concept that it does not literally denote in order to suggest comparison with another object or concept"* (Ortony 1979) (p 1). However, he is somewhat critical of the seemingly narrow applicability of the definition, arguing, *"it is not adequate for psychologists and theoretical linguists"* (Ortony 1979) (p 1). Soukanhov (1992), cited in Malinski (2009) (p 310), offers a more simple perspective stating *"a metaphor is a form of speech where 1 word or phrase is used to represent something else, thus figuratively as a comparison or symbol for the other".* This perspective arguably provides a logical conceptual base to explain the metaphorical phrases cited earlier. Malinski (2009) (p 310) also argues that *"metaphor has transformative potential: change your metaphor of the world, change your worldview"*. This suggests that metaphor has a broader multi-disciplinary application beyond the remit of its

traditional domains, as *"metaphor can serve as symbolic short-hand for understanding and communicating as one tells the narrative story of life"* (Malinski 2009) (p 310).

Tomlinson (1986) analysed over 2,000 interviews in which authors talked about their writing processes, she found that they used several metaphorical images to convey their ideas. She argued that during these interviews the vocabularies of cooking, mining, gardening and hunting, which were used to express personal views on writing processes, were not simply different ways of framing the same thing, they were indications of different cognitive structuring and interpretation of the writing process. This suggests, *"metaphor in language expresses connections in the level of thought"* (Deignan 2005) (p 2). Henceforth, it is this belief, which Deignan (2005) (p 2) suggests is *"arguably a [fairly] recent perspective"*, that metaphor can express different ways of thinking and of mentally structuring concepts, and ideas that informs the research design and validates the selection of metaphor analysis.

3.10.3.2 Visual Metaphor

Lakoff and Johnson (1999), cited in Ortiz (2011) (p 1568), argue that *"the overall theory of Primary Metaphor (linguistic) is a combination of 4 parts: Christopher Johnson's Conflation Theory, Grady's Primary Metaphor Theory, Narayanan's Neural Theory of Metaphor and Turner & Fauconnier's Conceptual Blending Theory".* Ortiz (2011) (P 1568) argues, *"even though the existence of non-verbal metaphor is admitted, research on the matter is only in the initial stages and the field remains largely unexplored"*. She cites Grady's (1997) perspective that *"if metaphors are part of our cognitive unconscious, inherent to human beings and a direct consequence of the nature of the brain, they must also be present in the visual corpus"*. This suggests that the concept of a metaphor is not simply a linguistic concern but also a visual one, with significant potential for communicative expression and knowledge sharing. Consequently, as visual metaphor has only been tentatively explored in terms of its broader research application its inclusion within the research design represents a valid contribution to knowledge in itself through the use of novel methods (Banks 2001, Banks and Zeitlyn 2015).

The concept of metaphor in both a linguistic and visual context has been researched within some academic disciplines. For example, linguistics (Barbosa-de-Oliveira and Dias-da-Silva 2010), semantics and pragmatics (Harries 1978, Lawely 2012), communications and media (Navarro et al. 2011) and within the business and management disciplines, primarily organisations research (Billups 2011, Lawely 2012), but is virtually untouched in disaster research. This study however is also located within the organisations and management domains, which have an historic association with metaphor-based theory and research, particularly the work of Morgan's *"Images of Organizations* (2007)*"*. This work is widely accepted within academia and industry as it has opened up new and innovative ways of conceptualising organisations; such is its importance that Morgan contends that all we know

about organisations is grounded in his 8 metaphors (Grant and Oswick 1996, Lang 2008, Morgan 2007). This validates the use of metaphorical analysis within this study.

3.10.4 Linguistic Metaphor Analysis

Moser (2000) (p 1) argues that *"metaphors are culturally and socially defined, yet they also represent a basic cognitive strategy of analogical problem solving that is context-sensitive, yet at the same time they are abstract models of reality".* The data capture strategy gathered a corpus of 30 of these abstract models of reality, which required the application of a systematic and comprehensive analysis process to generate the necessary research outcomes. However, before the analysis process commenced it was necessary to prepare the collated data for analysis. The visual data was relatively simple to prepare; each template was coded using the organisational codes listed in Fig 3.4 and assigned a number, either 1, 2 or 3, reflecting the number of the individual participant within each specific organisational sample-frame designed ensure anonymity (Jupp 2006). The linguistic data however, required a more thorough and time-consuming process of transcription, as a *"1-hour recording can take 8 or 9 hours to transcribe fully"* (May 2011) (p 152).

3.10.4.1 Transcription of the Linguistic Data

The use of DVR technology has improved the reliability of voice recording as it allows the researcher to concentrate on the discussion, take note of and react to the non-verbal gestures, rather than writing down what is said. Also, once the interview has started many people forget the DVR is on, including the interviewer (who can be interrupted when the tape shuts off noisily in the middle of the interview), which can help build a rapport and promote free and open dialogue (May 2011). Transcription though a laborious and time-consuming activity is *"essential to be able to refer accurately to the contents of the interview in order to draw on the data for analysis and for it to be the evidence on which a conclusion is based or an observation made and shared with others"* (Wadsworth 2011) (p 72). Transcription is a process of reproducing spoken words into written text, and in this particular study it required the verbatim transcription of the recordings (Halcomb and Davidson 2006).

Verbatim transcription can be described as the word-for-word reproduction of verbal data, where the written words are an exact replica of the audio-recorded words (Poland 1995). Halcomb (2006) however, argues that despite relatively limited literature there is considerable debate as to the cases for and against verbatim transcription. The combination of verbatim transcription coupled with the author's notation of the participant's non-verbal behaviour was considered as being central to the reliability, validity, and veracity of qualitative data collection (Halcomb and Davidson 2006, MacLean, Meyer and Estable 2004, Seale and Silverman 1997). Considerable debate remains as to whether an exact record of an interview is the best approach (Britten 1995, Halcomb and Davidson 2006). Halcomb (2006) (p 40) though, states that

"logically, it may be beneficial for researchers to transcribe their own interview data, given they have first-hand knowledge from their involvement in the interview process, expertise in the interview subject, and the advantage of having participated in both verbal and non-verbal exchanges with the participants". The use of written notes taken either during an interview or immediately afterwards is considered superior to the exclusive use of recordings that are subsequently transcribed, resulting in more accurate data (Fasick 1977, Halcomb and Davidson 2006, Wengraf 2001).

In considering the aforementioned factors, the research design adopted verbatim transcription, despite it known limitations, supported by note taking during the interviews. Although, verbatim transcription is time-consuming and laborious and authors such as MacLean et al (2004) and Wellard et al (2001) are critical of the approach citing a range of possible human-errors including misinterpretation of content, class, cultural differences and language errors, alongside the likelihood of producing too much data within the transcripts. The author acknowledges these views, but consideration of the Aim, Objectives and CRQ indicated that this inductive study sought interpretations of Command and Control through the collation of the participant's views in their own language. Thus, the likelihood of too much data was negligible as the linguistic metaphors were embedded within the recorded dialogue, which necessitated verbatim transcription. Also, the adopted conversational style, whilst initially designed to establish the author/participant rapport, enabled appropriate management of the interview had the added benefit of inducing additional linguistic data in the form of the interviewer's contribution to the discussion (Brewer and Williams 2005, Bryman 2012).

As the author is an experienced practitioner it was logical to expect that relevant linguistic metaphor usage by the interviewer within the transcript. As such, the author's discussion was also included in the transcription and analysis processes. This is a defensible as it links directly to the interpretivist paradigm, which considers the author as part of the study reflecting the view that the social world is seen to be produced and reproduced on a daily basis by people going about their lives (Livesey 2012, Willis 2007).

3.10.4.2 The Linguistic Metaphor Analysis Process

The interview transcripts were subjected to an analysis process based on Steen's (2010) 3-step Metaphor Identification Process (MIP). The 30 transcripts underwent 3 independent manual sweeps; the first was a simple review of the transcript for familiarisation. The second was conducted at least a day apart from the familiarisation sweep, and used Morgan's (2007) organisational metaphors and Lakoff et al (1991) Master Metaphor List as the coding reference point for the identification of the linguistic metaphors within each transcript. The third sweep was a repeat of the coding process at a later time using the base transcript (i.e. pre-analysis). The results of the second and third sweeps were compared to identify any differences and then combined to produce the research outcomes for that particular transcript. The coded data was

then sorted as per 3-tiered analysis logic sequence to identify the linguistic metaphors used by the sample-frame participants to express their views and interpretations of a Command and Control. This included the identification of similar and dissimilar patterns of linguistic metaphor usage, which met the requirements of Objectives 3 and 4, and informed the achievement of Objective 5 and 6.

3.10.5 Visual Metaphor Analysis

The use of visual metaphor analysis within this study was inspired by the work of the German researcher Christina Schachtner. The approach was selected to deepen understanding of Command and Control by engaging the visual domain through rich imagery. Visual metaphor analysis has seen extensive use in fields such as social anthropology, and media and communications amongst others, but is arguably a relatively contemporary and novel addition to the social science researcher's toolbox (Banks 2001, Banks and Zeitlyn 2015, Haught 2013, Wilken 2013). Visual metaphors differ from their linguistic brethren in that they use an image rather than words to make a comparison reflecting the old adage that *"a picture is worth a thousand words"* (Barnard 2014, National Arts Centre N.D.). The use of visual metaphor is also widely used in the arts and advertising, where their communicative power is well known and analysis is generally interpretative in nature, which reflects the chosen research paradigm (van Mulken, le Pair and Forceville 2010). The research design adopted a comparative interpretative approach to the visual metaphor analysis, which is outlined below.

3.10.5.1 The Comparative Interpretative Visual Metaphor Process

Comparative analysis at its most basic is about looking at 2 or more things in order to discover something about them (Jones 1985). As with the linguistic metaphor data, the 3-tiered analysis-logic sequence provided the base analytical framework for the visual data. Similarly, Morgan's (2007) organisational metaphors and Lakoff et al (1991) Master Metaphor List formed the coding reference point, and was augmented by the 2 Command and Control organigrams, which visually illustrated existing Command and Control policy. The analysis process was interpretative in nature as it intended *"to offer possible meanings"* for the patterns' and themes that emerged from this particular data set (Jewell 2013). The 5-step approach, which was designed to achieve Objective 4 and inform the achievement of Objective 5 and 6, is outlined below:

- **Step 1:** the visual metaphor data-set was viewed for general familiarisation purposes
- **Step 2:** the visual metaphors were interpreted by comparing the representations to existing Command and Control doctrinal organigrams to identify patterns of similarities or differences within the data-set
- **Step 3:** the visual data set was organised as per the analysis-logic sequence, and then systematically interpreted. The author identified visual representations of Morgan's

(2007) organisational metaphors and the linguistic metaphors contained within Lakoff et al's Master Metaphor List (Lakoff, Espenson and Schwartz 1991).

- **Step 4:** the identified patterns and themes were collated and organised as per the analysis-logic sequence to produce the visual research findings
- **Step 5:** the visual findings were analysed and a tentative theory will be posited

3.10.6 Comparative Analysis Framework

In order to meet the needs of Objective 5 it was necessary to undertake a comparative analysis of the complete data set using the 3-tiered analysis logic sequence as the base framework (Jones 1985). The analysis began at the national level, and then worked through both the sub-national and local first responder outcomes. The data was then analysed to identify similarities, differences, patterns and themes that emerged from the research. The outcomes then informed the development of a tentative theory pertaining to linguistic and visual metaphor usage in UK and US emergency management (Maxwell 2005). These outcomes and subsequent tentative theory comprehensively achieved Objective 5 and 6, and constitute the principal contribution to knowledge forwarded by this study.

3.10.7 Integrating the Research Outcomes

Mixed and multi-methods research differ in that both quantitative and qualitative methods must be combined within a mixed strategy rather than multiples of either one or the other drawn from a singular paradigm (Bryman and Bell 2015, Cresswell and Plano Clark 2011). Teddie and Tashakkori (2009) (p 7) define mixed methods as *"a type of research design in which qualitative and quantitative approaches are used in types of questions, research methods, data collection and analysis procedures, and/or inferences".* The chosen research design clearly adheres to this definition; however, the literature suggests variation in how other researchers apply the approach (Bryman and Bell 2015, Cresswell and Plano Clark 2011, Tashakkori and Cresswell 2007). *"Mixing"* can include different types of research question, sampling strategies, and data collection methods, types of data, data analysis or conclusions meaning there is considerable scope for innovative research design (Tashakkori and Cresswell 2007). In an effort to provide clarity, Tashakkori and Cresswell (2007) (p 4) present a more inclusive definition of mixed methods as *"research in which the investigator collects and analyzes data, integrates the findings, and draws inferences using both qualitative and quantitative approaches or methods in a single study or program of study"*. This notion of integration is perhaps key given the range of empirical, linguistic and visual data resulting from this study. However, it is worth noting that complete integration across all findings is not always possible and indeed may not be desirable as the fundamental purpose of mixed methods is to create research synergies (Cameron 2011, Cresswell and Plano Clark 2011, Cronholm and Hjalmarsson 2011, Hesse-Biber 2010, Tashakkori and Cresswell 2007).

A quantitative weighted summation method (Zardari et al. 2015) was used to assess the relevance of Morgan's (2007) metaphors to complement the predominantly qualitative research design. The resultant findings provided an assessment of the theoretical relevance of a well-known and accepted framework, and a preliminary indication of perceptual trends. Whilst, also providing the basis for the use of Morgan's approach (conceptual metaphor) as a meta-framework for the development of new theoretical constructs. The content analysis (Neuendorf 2002) afforded a rich insight into the current issues within emergency management in the words of practitioners. The linguistic metaphor analysis used the combination of Morgan's (2007) and Lakoff, Espenson and Schwartz's (1991) metaphor theories and Steen's (2007) Metaphor Identification Process (MIP). Whereas, the visual analysis was informed by Schachtner's (2002) research and also used the 2 aforementioned metaphor theories for analysis. This use of a broad range of theories, frameworks, methods, processes and domains (linguistic and visual) aligned this study with the general literature on mixed methods, and therefore enabled a categorisation as such (Bryman and Bell 2015, Cameron 2011, Cresswell and Plano Clark 2011, Cronholm and Hjalmarsson 2011, Hesse-Biber 2010, Tashakkori and Cresswell 2007). Furthermore, this study adopted a concurrent, rather than sequential mixed methods approach, whereby the quantitative and qualitative methods were applied at the same time rather than sequentially, which *"allows both sets of results to be interpreted together to provide a richer and more comprehensive response to the research question in comparison to the use of a mono method design*" (Saunders, Lewis and Thornhill 2012) (p 171). This enabled the findings to be integrated and synthesised, following analysis, to create new theory which was collated together within the Command and Control Interoperability Tool Box (CCIT-Box) to form the primary contribution to knowledge made by this study.

The CCIT-BOX is a collection of tools and theories designed to link theory more closely to practice by using metaphor as a communicative framework to enhance the interoperability of emergency management organisations. The weighted summation method (Zardari et al. 2015) assessed the relevance of Morgan's (2007) metaphors, and also demonstrated that conceptual metaphor was a viable mechanism for conveying deeper meaning within and across emergency management organisations. As such, Morgan's approach was used as a meta-framework informing the initial design and development of 5 conceptual metaphors; indeed, his theory underpinned all data sets such was its importance to this study. The posited theoretical constructs synthesised all aspects of the study in a veritable *"melting pot"* to generate new conceptual metaphors. The literature review findings, the empirical, linguistic and visual data sets were blended with the content analysis themes to create the theoretical core of the 5 conceptual metaphors. This process was summarily inferential, although in some cases explicitly induced metaphors (i.e. Golden Thread) were used to create theory (Cresswell and Plano Clark 2011, Teddie and Tashakkori 2009). Indeed, as metaphors are non-literal entities the process underpinning their creation could not be too literal (Morgan 2007, Renz 2009). It needed to take account of the context of what was effective in conveying meaning to ensure

the appropriateness of the research outcomes to the field. Whilst, the use of Morgan (2007), Lakoff, Espenson and Schwartz (1991), Steen (2007) and Schachtner (2002) established the framework or the *"pot"* if you will. The empirical, content analysis, linguistic and visual metaphor analysis data sets provided the *"ingredients"* for the *"melting pot"*. This metaphor explains the mixed methods integration of findings used to develop the conceptual metaphors. The Theory of Interoperability Metaphors on the other hand was produced more simply by integrating analytical methods, rather than outcomes. Though much simpler, this resulted in a deep and theoretically rich data set with significant potential for future research which is discussed later.

3.10.8 Threats to Reliability, Validity and Generalisability

3.10.8.1 Reliability

Reliability is important to ensure that if another researcher was to replicate the study consistent findings would be produced (Bryman and Bell 2015). Saunders, Lewis and Thornhill (2012) (p 192) argue that there are 4 threats to reliability; participant error, participant bias, researcher error and researcher bias, which must be addressed within the research design. To mitigate participant error interviews were scheduled within office hours wherever possible. However, due to the participant's roles this was not always possible. Some interviews took place at emergency services premises out of hours and during working shifts. Access to refreshments and flexible time allocation ensured that both the author and the participant were as relaxed as possible, and participants could drop in an out of interviews to deal with operational matters, or reschedule instead of feeling pressured to rush the interview.

Participant bias, whereby a false answer may be induced, was an important consideration though, given the adopted interpretivist paradigm the focus was on gathering their views (Saunders, Lewis and Thornhill 2012). Most interviews were conducted in a quiet office in a secure location, which reduced the likelihood of participant bias. Although, one was done at the supervisor's desk within the Ambulance service Control Room, which was a suitable distance away from colleagues. Another, at Police Headquarters during a night-shift, and the participant was occasionally required to deal with operational matters. However, flexible administration and timing ensured appropriate conduct.

Researcher error and bias are also significant factors that must be incorporated into the research design (Saunders, Lewis and Thornhill 2012). Researcher error pertains to anything which may alter the researcher's interpretation. Whereas, researcher bias refers to the researcher allowing his/her own subjective view to influence the study (Bryman and Bell 2015, Saunders, Lewis and Thornhill 2012). Researcher error was mitigated by a combination of the author's practitioner experience, knowledge gained from the US research placement and research prior to the field study. Thus, the author was well prepared and versed in the language and culture of emergency management, minimising the likelihood of error.

Reflecting the adopted interpretivist paradigm, the notion of a truly unbiased researcher was rejected (Williams 2000). This study focused on collating personal views of Command and Control. Accordingly, the research design accepted that as a former practitioner experienced in Command and Control the author had relevant views and biases. As such, the question schedule design and conversational interview style afforded participants the requisite freedom to express their views, discuss, challenge and debate varying perspectives, as indeed this was the essence of the study.

3.10.8.2 Validity

Bryman and Bell (2015) (p 170) argue, *"validity refers to the issue of whether or not an indicator (or set of indicators) that is devised to gauge a concept really measures that concept"*. Consequently, the research design incorporated steps to ensure validity. Morgan (2007) and Lakoff, Espenson and Schwartz (1991) are widely known and accepted theories, thus are valid for testing metaphor in the chosen setting (Saunders, Lewis and Thornhill 2012). The work of Schachtner (2002) is much lesser known, and was considered an experimental, but none the less valid, method within this study. The combination of these theoretical lenses supported by content analysis ensured an appropriate degree of validity.

3.10.8.3 Generalisability

The issue of generalisability is perhaps more of a positivist concern (Easterby-Smith, Thorpe and Jackson 2008). In the case of this interpretivist study the findings are a snapshot of the views, opinions and perspectives of the sample-frame within the geographic remit and time-frame of the study. Thus, the results are not generalisable to emergency management as a whole. However, steps were taken to increase the relative generalisability. The organisational sample-frame was as broad as was practicable, and all levels of the UK and US Command and Control frameworks were engaged. Also, 3 participants from each organisation were interviewed to allow for an element of triangulation (Bryman and Bell 2011). Although, the findings are not broadly generalisable the resultant theoretical and methodological contributions have a wider application (see chapter 6).

3.11 Ethical Considerations

Denscombe (2010) (p 306) states that *"social researchers are expected to approach their task in an ethical manner; on moral grounds, this expectation stems from the belief that the public should be protected from researchers who might be tempted to use any means available to advance the state of knowledge on a given topic".* May (2011) (p 47) also highlights the importance of ethical social research stating, *"ethics are fundamental in maintaining the integrity and legitimacy of research in society and in protecting practitioners and participants in its*

practice". Diener and Crandall (1978) cited in Bryman (2011) (p 128) have usefully broken ethical research down into 4 areas:

1. Whether there is harm to the participants
2. Whether there is lack of informed consent
3. Whether there is an invasion of privacy
4. Whether there is deception involved

Accordingly, an Ethical Statement was submitted to the former Glamorgan University Faculty Research Programme Committee and approval was granted in summer 2009. The basis for the Ethical Statement was an overt assurance that research activity within this study would not contravene any of Diener and Crandall's (1978) 4 areas of ethical research outlined above. The ethics strategy was communicated to the participants in the Welcome Letter and Briefing Note (see Appendix 4), which were disseminated to participants 2 weeks before each interview to allow time for assimilation and the clarification of any questions. The strategy included 4 elements and is detailed below:

1. **Informed Consent:** participants were advised of the research focus, design and intent within the Welcome Letter. At the commencement of each interview the DVR was started, the author explained the Informed Consent Form (see Appendix 5) allowing for any questions to be asked, and then the participant was asked to sign the document. This approach secured both written and verbal consent adhering to the ethical parameters of social research (Bryman 2012, Denscombe 2010).

2. **Right to Withdraw:** participants were advised of their Right to Withdraw from the study at any point, and assured that no questions would be asked. This was clearly articulated within the Welcome Letter and Interview Briefing Note, this assurance was also reviewed at the beginning of each interview, and the respective discussion captured on the DVR recording (Wiles et al. 2011).

3. **Confidentiality and Anonymity:** confidentially and participant anonymity was assured through the organisational coding strategy, which prevented the identification of individual participants and their parent organisations (Saunders, Lewis and Thornhill 2008). Please note explicit permission was secured, which allowed the identification of the *"gatekeepers"* engaged within the access strategy.

4. **Data Security:** to minimise the risk of a data security breach through the inadvertent loss of a DVR a 2-fold strategy was implemented. Firstly, the names of participants were not used during DVR recording. Rather, the author stating the organisational code and participant number opened each recording, with the date, time and generic

location (i.e. UK Ambulance HQ etc) to prevent identification in the unlikelihood that unauthorised access to recordings took place. Secondly, on completion of each interview the author connected to the Coventry University server through the Remote Desktop Connection (RDC) whilst in the secure interview room, and uploaded the voice recording to a secure password protected location and deleted the file from the DVR (Coventry University IT Services 2012). Where remote access was not possible, the author secured both DVRs in an internal pouch within his equipment bag. This was then secured with a small padlock to prevent any accidental loss during transit, and the voice recordings were then uploaded to the server at the earliest possibility, and then deleted from the DVR.

Adherence to this strategy ensured compliance with the ethical standards required by the University of South Wales and the relevant social research bodies (Economic and Social Research Council 2006, Economic and Social Research Council 2011, Social Research Association 2003).

3.12 Summary of Research Strategy

Fig 3-8: Summary of the Research Strategy

- **Paradigm:** Interpretivism
- **Methods:** Mixed Methods

Obj	Logic	Task	Method or Tool	Data Type
1	Deductive	Literature Review to establish CRQ	Literature Review Framework	Qualitative
2	Deductive	Assess relevance of Morgan's metaphors	Semi-Structured Interview	Quantitative
3	Inductive	Capture linguistic & visual metaphors	Semi-Structured Interview	Qualitative
4	Inductive	Metaphorical analysis (coded)	1) Master Metaphor List 2) Morgan's Metaphors 3) C&C organigrams	Qualitative
5	Inductive	Comparative data analysis	Comparative Analysis Framework	Qualitative
6	Inductive	Development of learning tools	Linguistic metaphor Visual metaphor Weighted summation	Qualitative Qualitative Quantitative

4 Research Findings

4.1 Introduction

This chapter presents the findings and is organised thematically following the theoretical and methodological approaches identified in chapters 2 and 3. To aid with the contextualisation of the findings the Aim, Objectives, Central (CRQ) and Supporting Research Questions (SRQ) are reviewed herein.

This study aimed to: *"identify linguistic and visual metaphorical interpretations of Command and Control held by British and American emergency management practitioners in order to enhance multi-agency interoperability"*,

This was underpinned by 5 Objectives:

1. *Develop a comprehensive literature review focused on Command and Control within UK and US emergency management*
2. *Assess the relevance of Morgan's* (2007) *organisational metaphors within UK and US emergency management*
3. *Produce linguistic and visual data that encapsulates emergency management practitioner's views on Command and Control*
4. *Identify linguistic and visual metaphors of Command and Control used by UK and US emergency management practitioners*
5. *Compare and contrast the findings inter and intra country to identify patterns and trends*
6. *Develop a suite of learning tools to enhance critical understanding of Command and Control*

The CRQ was: *"how do U.K. and U.S. emergency management practitioners metaphorically interpret Command and Control?"*

The CRQ was underpinned by 4 SRQs, which were:

1. *Is Morgan's* (2007) *organisational metaphor theory relevant to UK and US emergency management?*
2. *What metaphors do UK and US emergency management practitioners use to make sense of Command and Control?*
3. *Does understanding of Command and Control vary across key organisations in UK and US emergency management?*
4. *Do interpretational differences in Command and Control affect the level of interoperability between emergency practitioners?*

The findings are organised into 3 categories: an application of Morgan's metaphors, the linguistic findings and then the visual findings. Each section briefly sets out the relationship between the findings and the research objectives of the study. Please note: the page orientation switches between portrait and landscape at various points to allow tables, diagrams and visual metaphors to be viewed more easily.

4.2 Empirical Data: Assessing Morgan's Metaphors

Objective 2 sought to *"assess the relevance of Morgan's* (2007) *organisational metaphors within UK and US emergency management"* to establish a logical base for a comprehensive inductive study using both linguist and visual metaphor. Morgan's (2007) organisational metaphor theory was selected for this purpose, as it hasn't been applied within disaster research previously. Organisations theory and meta-theory are widely accepted sub-themes within business and management research. Indeed, Morgan's Images of Organizations (2007) is widely acclaimed, having been cited over 15,000 times according to Google Scholar[1]. Furthermore, researchers within the British Academy of Management's Special Interest Groups (SIG) on Organizational Transformation, Change and Development (British Academy of Management 2015a), and Leadership and Leadership and Development (British Academy of Management 2015b) apply Morgan's work in various management contexts. Lambert III (2009) (p 158), though acknowledging the limitations of metaphor, stated *"the skilful use of this common figure of speech can be invaluable for anyone deeply involved with organisational change and leadership"*, highlighting the practical as well as theoretical relevance of the approach.

The focus of this part of the study was practitioner interpretations of Command and Control using Morgan's widely recognised theory which has been applied in a novel organisational setting – emergency management. Indeed, Lang (2008) (p 2) argues that Morgan's approach *"has been regularly revised and published over 20 years demonstrating its on-going relevance and contemporary status"*. Whilst, Ramirez (2003) also cited in Lang (2008) (p 2) states that Morgan *"convincingly argues that all we know of organisations rests on 8 metaphors".* This illustrates the rationale underpinning the selection of Morgan's theory as an initial framework for the use of metaphorical analysis within this study.

4.2.1 Review of the Weighted Summation Method

In order to establish the relevance of Morgan's (2007) metaphor, a weighted summation method was selected and though detailed within the methodology chapter it will be briefly reviewed to aid readability.

[1] Search conducted 14th October 2015

During interview each of the 30 participants were asked to rank Morgan's metaphors in order of relevance to their individual views of Command and Control. Each was given as much or as little time as they needed to complete the task, and they were free to rank as many or as few of the metaphors as they felt reflected their views. The interview process was facilitated in a conversational style so participants were able to ask for clarification, pose questions and engage in further discussion as they wished. This dialogue was subsequently included in the interview transcript and subjected to the linguistic metaphor analysis adding to the rich depth of the study. The rankings data was collated and coded to ensure participant anonymity and Figs 4.0 and 4.1 (see below) were produced to display the general rankings data for both the UK and US data sets. These tables provide an overview of the raw data illustrating the rank order noted by each participant. A weighting mechanism (see Fig 3.5) was then applied to enable metaphor-ranking scores to be calculated. Fig 4.2 contains the weighted summation calculations (Zardari et al. 2015), which produced outcomes for both the UK and US respectively, and the combined data sets to provide a relative indication of trends.

Following this, the metaphor rankings for the data sets were tabulated using conditional formatting within Microsoft Excel to visually illustrate patterns within the data. Though relatively basic this method provided a simple but effective means with which to present and interrogate the data. The author readily accepts that more in depth quantitative analysis was possible given nature of the data set. However, to achieve Objective 2, which was to *"assess the relevance of Morgan's* (2007) *organisational metaphors within emergency management",* such depth was not required. At its most basic, a simple *"yes the theory is relevant"* or *"no it is not"* was all that was required. However, this study went beyond that by analysing the data to provide a relative indication of the sample-frame's level of perceptual interoperability, whilst also establishing the basis for an analysis tool (discussed later) that aids the collective understanding of Command and Control in practice.

Figs 4.0 and 4.1 below display the rankings data for each participant by country. The numbers denote the rank that participants assigned their chosen metaphors indicating the relevance of each. The conditional formatting provides a colour-coded transition from green denoting the highest rank through to red for the lowest ranked metaphors to visualise the patterns in the data. The number of selections made by each participant is noted at the foot of each column, and the total number of times a given metaphor was selected is listed at the end of each row. Each participant ranked the metaphors 1 to 9, selecting as many or a few as they deemed relevant. Please note: a dash (-) indicates that a metaphor was not selected.

4.2.2 General Ranking Data – United Kingdom

Fig 4-1: Metaphor Rankings Data – United Kingdom																
Metaphor	**CG1**	**CG2**	**CG3**	**LG1**	**LG2**	**LG3**	**P1**	**P2**	**P3**	**F1**	**F2**	**F3**	**A1**	**A2**	**A3**	**SEL**
Culture	2	1	3	1	1	-	-	2	5	3	3	-	4	-	1	***11***
Brain	1	-	1	-	-	-	-	1	2	1	4	2	3	2	3	***10***
Machine	-	-	2	-	3	-	-	-	4	4	2	1	5	1	5	***9***
Organism	-	-	4	-	-	-	-	-	1	2	5	-	1	-	4	***6***
Flux & Transformation	3	-	5	-	-	-	-	-	-	-	1	-	2	-	2	***5***
Political System	-	-	6	-	2	-	-	-	3	-	-	-	-	-	6	***4***
Psychic Prison	-	-	7	-	4	-	-	-	-	-	-	-	-	-	7	***3***
Instrument of Domination	-	-	-	-	4	-	-	-	-	-	-	-	-	-	8	***2***
None of the Above	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	***2***
Total	*3*	*1*	*7*	*1*	*5*	*1*	*1*	*2*	*5*	*4*	*5*	*2*	*5*	*2*	*8*	**-**
LEGEND: CG = Central Government, LG= Local Government, P = Police, F = Fire, A = Ambulance, SEL = Number of selections																
*LG2 was unable to separate Psychic Prison and Flux and Transformation so they were assigned a joint-ranking																

4.2.3 General Rankings Data – United Kingdom

The sections below detail the findings outlined in Fig 4.1 focusing the rankings of each individual metaphor.

4.2.3.1 Culture

Culture was selected 11 times and was therefore the most ranked metaphor, with only LG3, P1, F3 and A2 not selecting it. It was ranked 1st on 4 occasions by CG2, LG1, LG2 and A3. CG1 and P2 ranked it 2nd. CG3, F1 and F2 ranked it 3rd whereas A1 and P3 ranked it 4th and 5th respectively.

4.2.3.2 Brain

Brain was selected 10 times and as ranked 1st on by CG1, CG3, P2 and F1. It was ranked 2nd on 3 occasions by P3, F3 and A2 and 3rd by A1 and A3. F2 ranked this metaphor in 4th.

4.2.3.3 Machine

F3 and A2 ranked Machine 1st and CG3 and F2 ranked it 2nd LG2 ranked it 3rd, P3 and F1 4th and A1 and A3 5th totalling 9 selections.

4.2.3.4 Organism

Organism was selected 1st by P3 and A1, 2nd by F1, 4th by CG3 and A1, and 5th by F2 for 5 selections in total.

4.2.3.5 Flux and Transformation

This metaphor was selected 5 times. F2 ranked it 1st, A1 and A3 second. CG1 ranked it 3rd whereas CG3 ranked it 5th.

4.2.3.6 Political System

Political System was ranked 2nd by LG2 and 3rd by P3, and both CG3 and A3 raked it 6th for a total of 4 selections.

4.2.3.7 Psychic Prison

Psychic Prison was selected 3 times: it was ranked 4th by LG2 and 7th by CG3 and A3 respectively.

4.2.3.8 Instrument of Domination

The Instrument of Domination metaphor was selected twice by LG2 who ranked it 4th and A3 who ranked it 8th

4.2.3.9 None of the Above

None of the Above was selected by LG3 and P1 as both felt none of the metaphors matched their views

4.2.4 General Ranking Data – United States of America

Fig 4-2: Metaphor Rankings Data – United States of America																
Metaphor	**FE1**	**FE2**	**FE3**	**S1**	**S2**	**S3**	**LE1**	**LE2**	**LE3**	**FR1**	**FR2**	**FR3**	**E1**	**E2**	**E3**	**SEL**
Brain	3	2	-	-	3	3	3	-	7	3	1	1	-	1	3	***11***
Machine	-	-	-	1	2	1	1	1	5	4	2	3	1	-	-	***10***
Culture	1	1	-	-	4	5	-	-	4	1	-	2	2	3	2	***10***
Political System	2	-	-	-	5	4	2	-	6	2	-	5	-	-	1	***8***
Organism	-	-	-	-	1	-	-	-	3	7	-	4	-	2	-	***5***
Flux & Transformation	-	-	-	-	6	2	4	-	2	6	-	-	-	-	-	***5***
Instrument of Domination	-	-	-	-	-	-	-	-	7	8	-	-	-	-	-	***2***
None of the Above	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	***1***
Psychic Prison	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	***0***
Totals	***3***	***2***	***1***	***1***	***7***	***5***	***4***	***1***	***8***	***8***	***2***	***5***	***3***	***3***	***3***	**-**
LEGEND: FE = FEMA, LG= State Emergency Management, LE = Law Enforcement, F = Fire and Rescue, E = Emergency Medical Services, SEL = Number of selections																

4.2.5 General Rankings Data – United States of America

Fig 4.2 above displays the general rankings data for the US rankings.

4.2.5.1 Brain

The Brain metaphor was selected 11 times with FR2, FR3 and E2 ranking it 1st. FE2 ranked it 2nd and it was ranked 3rd by FE1, S2, S3, LE1, FR1 and E3: LE3 ranked it 7th.

4.2.5.2 Machine

S1, S3, LE1, LE2, and E1 ranked Machine 1st, whereas S2 and FR2 ranked it 2nd. FR3 ranked it 3rd, FR1 4th and LE3 5th respectively totalling 10 selections.

4.2.5.3 Culture

Culture was also selected 10 times with FE1, FE2 and FR1 ranking it 1st. FR3, E1 and E3 ranked it 2nd and E2 3rd. S2 and LE3 ranked the metaphor 4th, and S3 ranked it 5th.

4.2.5.4 Political System

E3 ranked this metaphor 1st, FE1, LE1 and FR1 ranked it 2nd. S3 ranked it 4th, S2 5th and S2 and FR3 ranked it 5th, and LE3 ranked it 6th totalling 8 selections.

4.2.5.5 Organism

The Organism metaphor was selected 5 times; S2 ranked it 1st and E2 2nd. LE3 raked it 3rd and FR3 ranked it 4th whereas FR1 ranked it 7th.

4.2.5.6 Flux and Transformation

Flux and Transformation was ranked 2nd S3 and LE3, and 4th by LE1, whereas both S2 and FR1 ranked it 6th for a total of 5 selections.

4.2.5.7 Instrument of Domination

LE3 and FR1 ranked this metaphor 7th and 8th respectively.

4.2.5.8 None of the Above

FE3 was the only US participant to select None of the Above

4.2.5.9 Psychic Prison

Psychic Prison was not selected

4.2.6 Metaphor Ranking Scores – Weighted Summation

Fig 4.3 below provides an overview of the metaphor ranking scores for the UK, US and combined data sets calculated using the weighted summation method (Zardari et al. 2015). This method built upon the rankings in Figs 4.1 and 4.2 by applying the weighting mechanism, detailed in Fig 3.6, to determine a collective score for each individual metaphor. This process added analytical value by identifying those metaphors that can be considered most meaningful to the sample-frame. Consistently higher ranked metaphors accrued greater scores, as their value within the weighting mechanism was higher. Thus, the greater the total scores the higher the overall relevance of the metaphor. As acknowledged in the methodology this method provides only a relative indication of metaphorical cognizance. However, it fully achieved the necessary outcome because the presence of data covering a range of metaphors indicated that Morgan's theory was relevant. Thus, answering the SRQ *"is Morgan's* (2007) *organisational metaphor theory relevant to UK and US emergency management?"*

Fig 4-3: Metaphor Ranking Scores – Weighted Summation	**Scores**		
Metaphor	**UK**	**US**	**TOTAL**
Brain	84	**90**	**174**
Culture	**88**	78	166
Machine	65	84	149
Organism	45	34	79
Political System	23	54	77
Flux & Transformation	38	30	68
None of the Above	20	10	30
Psychic Prison	12	17	29
Instrument of Domination	8	5	13
TOTAL	383	402	785
Weighting Mechanism: Rank 1 = 10, 2 = 8, 3 = 7, 4 = 6, 5 = 5, 6 = 4, 7 = 3, 8 = 2, None of the Above = 0			

4.2.6.1 Combined Scores

Within the combined data set the Brain metaphor with its constituent traits of learning, parallel information processing, distributed control, mind-sets, intelligence, feedback, requisite variety, knowledge and networks ranked highest scoring 174. As such, the sample-frame most readily associated these metaphorical traits with their interpretations of Command and Control. This was closely followed by the Culture metaphor with its traits of society, values, beliefs, laws, ideology, rituals, diversity, traditions, history, service, shared vision and mission, understanding, qualities and families, which ranked 2nd with a score of 166. The Machine

metaphor with its traits of efficiency, waste, maintenance, order, clockwork, cogs in a wheel, programmes, inputs and outputs, standardisation, production, measurement and control and design was ranked 3rd scoring 149.

There was a significant 70 point decrease in the scores between Machine and the 4th highest ranked metaphor Organism with it traits of living systems, environmental conditions, adaptation, life cycles, recycling, needs, homeostasis, evolution, survival of the fittest, health and illness. Political System, with its traits of interests and rights, power, hidden agendas and back room deals, authority, alliances, party-line, censorship, gatekeepers, leaders and conflict management, ranked 5th scoring 77, and ranking 6th was Flux and Transformation with its traits of constant change, dynamic equilibrium, flow, self-organisation, systemic wisdom, attractors, chaos, complexity, butterfly effect, emergent properties, dialectics, and paradox with a score of 68.

There is then a 2nd significant decrease of 30 points to the 7th ranked score, None of the Above. Psychic Prison with its traits of conscious & unconscious processes, repression & regression, ego, denial, projection, coping & defence mechanisms, pain & pleasure principle, dysfunction, workaholic ranked eighth with a score of 29. The lowest ranked metaphor with a score of 13 was the Instrument of Domination with its traits of alienation, repression, imposing values, compliance, charisma, maintenance of power, force, exploitation, divide and rule, discrimination and corporate interest.

4.2.6.2 United Kingdom Scores

Within the UK data set Culture ranked highest with a score of 88, this was closely followed by Brain, which ranked 2nd with a score of 84. There was a 19-point drop as the 3rd highest scoring metaphor was Machine, which scored 65. A similar drop of 20 points followed to Organism, which ranked 4th with a score of 48. 5th was Flux and Transformation with 38. In 6th was Political System with 23 and in 7th None of the Above with 20. The 2 lowest scoring metaphors were Psychic Prison with 12 and Instrument of Domination with 8

4.2.6.3 United States of America Scores

Brain ranked highest in the US data set with a score of 90, followed by Machine, in 2nd, with a score of 84. Culture ranked 3rd with 78 and in 4th was Political System with 54. The scores then dropped by 20 points to the 5th ranked metaphor Organism, which scored 34. Flux and Transformation ranked 6th with 30 points and in 7th was Psychic Prison with a score of 17. None of the Above and Instrument of Domination, which scored 10 and 5 respectively, were the 2 lowest scoring options.

4.2.7 Morgan's Organisational Metaphors in Emergency Management: Summary of Findings

The data in Figs 4.1 and 4.2 indicated that the sample frame lacks a dominant interpretation of Command and Control, as there was variation in how the metaphors were ranked. However, the conditional formatting illustrated a degree of shared understanding centred on the Brain, Culture and Machine metaphors and, to a lesser extent Political System (US data) illustrated by the pattern of colour dispersal. This is corroborated by the weighted summation calculations in Fig 4.3, which provided a relative empirical indication of each metaphor's perceived relevance to Command and Control. As such, multi-agency command groups are likely to have a fragmented understanding of the Command and Control, which may hamper interoperability. This demonstrated the communicative power and potential of metaphor to unlock and convey deeper meaning within disaster research (Lakoff and Johnson 2003, Lambert III 2009, Morgan 2007). Thus, the data collectively demonstrated the relevance of Morgan's metaphors to disaster research and summarily achieved Objective 2.

4.3 Linguistic Data – Interview Findings

4.3.1 Content Analysis Findings

The 30 interview transcripts were rich in thick qualitative detail. Indeed, cumulatively the transcripts totalled some 300,000 words and though laborious the verbatim approach proved useful in ensuring rigorous analysis. However, due to the conversational interview style, which allowed for the requisite depth and in some cases the prior working relationship with the participants, the discussions and therefore the transcripts contained references to operations, tactics, politics and other sensitive information not in the public domain. Consequently, these were restricted to ensure anonymity and comply with the University of South Wales Code of Practice for Research Students (2014), and indeed the Official Secrets Act (1989). However, it remained necessary to contextualise the metaphorical findings within the broader thematic findings, which is where Content Analysis proved useful (Gibbs 2007, Neuendorf 2002). This process of qualitative sense making aided in the achievement of Objective 3 whilst, also providing a valuable research contribution in its own right. In this study, its inclusion was vital to the analysis process as it provided much-needed context that aided in the understanding of the more focused linguistic and visual metaphor data.

4.3.2 Content Analysis Themes

4.3.2.1 Qualitative Themes – United Kingdom

The UK element of the content analysis process identified 18 themes, the data was interrogated then reviewed, and the themes were broken down and combined until the data set became saturated (Gibbs 2007). Please note, although this study was focused on metaphor, developing

an understanding of the general issues surrounding Command and Control in practice, and broader themes in emergency management was congruent with the Aim and Objectives. To focus solely on metaphor risked isolating the study from the broader field, and considering a key focus was interoperability this was deemed unacceptable.

4.3.2.1.1 Terminology and Concept Uncertainty

Participants cited numerous examples of problems caused by misunderstandings, misinterpretations and different interpretations of terminology, legislation, policy, guidance and procedures at a national, sub-national and local level. This theme appeared 33 times in the UK transcripts.

4.3.2.1.2 Single Loop Learning

All 15 UK participants forwarded well informed and thought out ideas for improving UK emergency response. However, all were conceptualised within the existing Command and Control framework and may be classified as tweaks rather than fundamental changes to existing approaches. No participant questioned whether Command and Control was the right approach for emergency response. This theme appeared 18 times.

4.3.2.1.3 Scale

The issue of scale was a consistent theme appearing 16 times in 9 transcripts, specifically CG1, CG2, CG3, LG3, F3, P1, P2, F3 and A3. Views varied with F3 stating, *"we react the same no matter what",* however there was a general view that whilst, the UK framework is scalable, the country does not have any experience of *"catastrophes"*. The UK was felt to be good at managing smaller incidents but would be reliant on this ability to cope whilst the response is ramped up from the local level should one occur.

4.3.2.1.4 Command and Control is Essential

All UK participants unequivocally stated that Command and Control was absolutely essential to emergency management, this theme appeared 15 times.

4.3.2.1.5 Origins of Command and Control

There was a vague awareness that Command and Control originated from the military, which appeared 15 times. Although, there was no clear understanding of how or when the current UK framework was developed or implemented. P2 was aware that it developed in the 1970s. However, CG2 was quite adamant that *"there's no necessary reason for me to know that"*.

4.3.2.1.6 Tried and Tested

Building on the Command and Control is essential theme; participants generally felt that the UK framework was tried and tested though numerous suggestions for improvements were forwarded. This view was particularly strong with the blue-light services, P1, P2, P3, F1, F2, A1 and A2 all provided strong endorsements for the UK framework, as did CG1 and CG2, with this theme appearing 15 times.

4.3.2.1.7 Blue Light Dominance

LG1, LG2 and LG3 felt that the blue-light services, particularly the Police service, dominated within the local Command and Control framework, despite the unified command principle being enshrined in the Civil Contingencies Act (2004). A3 also echoed this, whilst F3 pointed out command isn't in their (non-*"blue-light"* services') DNA. P3 stated *"you've got your Chief Execs below me in Gold"* signalling a belief that that Police Gold commanders are senior to all other commanders at the Gold level despite the stated Police coordination rather than command role, which is clearly stated in national policy. This theme appeared on 13 occasions.

4.3.2.1.8 Confused Roles, Responsibilities and Expectations

A1, A3, CG2, CG3, F2 and LG3 cited specific examples of false expectations of what organisations and the public will and won't do in an emergency indicating that roles and responsibilities are often unclear. Most participants alluded to a general feeling that expectation of who does what, who is in *"charge"* and of capabilities varied across the key agencies: the theme appeared on 10 occasions.

4.3.2.1.9 Information Sharing

CG1, CG2, CG3, F1, F2 and A3 all cited specific issues with information sharing, appearing 10 times. The issues raised included overly cautious restriction of information meaning agencies and the public cannot appropriately prepare for threats and hazards they are unaware of. A reticence to share information across government departments and partner organisations, a deluge of requests for information and information itself, and the need to effectively manage information flows to support decision-making.

4.3.2.1.10 Flexibility

There was a general view, noted on 9 occasions that the UK Command and Control framework is flexible as command is devolved to the lowest appropriate level, usually local. CG2 and CG3 referred to guidance that could be applied in a flexible manner though CG1 cited an example of the national level questioning local judgment on which advice and direction to follow. F1, F2 and F3 all seemed to conceptualise their Command and Control frameworks as separate and

needing to fit it in with others through the use of initiative and working outside of the stated plans, policies and procedures. LG1 suggested that *"blue-light"* organisations *"struggle with that concept of flexibility within Command and Control"* arguing a rigidity of approach, questioning how much flexibility can actually be built into the system.

4.3.2.1.11 Relationships

P1, CG1, CG2, LG2 and F2 cited 9 specific examples of prior relationships being critical to the effectiveness of Command and Control. However, this theme was embedded within the narratives of all 15 UK transcripts highlighting the inherent multi-agency nature of Command and Control, which is reliant on interpersonal relationships. However, CG2 pointed out that due to austerity related budget cuts many agencies had withdrawn from LRF activities focusing on statutory duties only in order to meet heavy budget shortfalls, which arguably reduces multi-agency resilience and preparedness.

4.3.2.1.12 Critiques of Command and Control

Specific criticisms of Command and Control rather than improvements to the existing framework were noted on 9 occasions. These included A3 and LG1 suggesting that the approach was not suitable for *"slow-burn"* incidents such as severe weather, flooding and pandemics. P3 posited *"for very large incidents people find 3-tiers too restrictive and too shallow"* propagating a bigger incident equal's bigger Command and Control mentality.

LG2 was quite scathing suggesting that Command and Control in local government *"would be a nightmare"* and *"it's not a phrase we'd ever use outside of the emergency role"* and *"it provides a built in assumption that command have experience and know what to do",* which is not necessarily always the case as role does not always equate to experience.

4.3.2.1.13 Political and Senior Command Direction/Interference

A3, P3, CG1, LG1 and LG2 cited 8 specific examples of needless higher command or political interference in the activities at lower levels causing disruption or un-necessarily increasing the workload. Throughout the transcripts examples of central government interference or the *"long screwdriver"* from Whitehall were also noted. Also a phenomenon whereby commanders at higher level become involved or focused on operations at a lower level was a commonly reported irritant and disruption. LG2 specify referred to a perceived Police and Fire service need to check decisions before taking action and their top-down approach, which was seen as being a different way of working from local government.

4.3.2.1.14 Order Out of Chaos

CG1, CG3, LG2 and P3 made direct reference to the purpose of Command and Control being to bring order to the chaos of an *"emergency"* on 7 occasions. CG3 referred to benefits of the militaristic approach and militaristic origins of the UK framework. P3 suggested that it is needed to control human nature and impulse, which was viewed in a negative sense leading to danger

4.3.2.1.15 Technical versus Human Factors

A2, A3, CG1, CG3, and LG1 highlighted the importance of humans as well as technology within Command and Control at 7 points. However, F1 frequently used the phrase *"interoperability"* to refer to the AIRWAVE digital radio system, *"used interoperability a few times now in anger but not on a really regular basis"* illustrating a distinctly technical perspective. This is an example of where the common terminology is used but the cognitive meaning was different.

4.3.2.1.16 Silo Mentality (Lack of Integration)

A2, F1, F2 and F3 cited 7 examples of what can be termed silo-mentality or lack of integration with other agencies. A2 suggested that *"interaction between us (Ambulance) and the Fire service and the Police as we don't tend to gel very much"* and *"we're just stuck in our silos".* F1 stated there is still silo mentality in government and *"interoperability: are we there yet, absolutely not",* whereas F2 and F3 talked about dropping barriers and being more integrated. Furthermore, throughout the 15 transcripts the dialogue focused at various points on how agencies could work together better, create synergy within tighter budgets, work smarter, come *"out of their shells"* which suggests that silo-mentality is a current issue within the field.

4.3.2.1.17 Non-integration of Recovery

A3 and CG1 were the only 2 UK participants to mention recovery operations. A3 stated *"what doesn't work so well is usually in the transfer of response to recovery at what point does that get handed over and at what point do you start recovery even though… erm… the response is still on-going"*, and CG2 said *"and I think another thing we don't well enough is recovery it is an add on".* This is significant as recovery is an integrated part of the UK emergency framework; however, the lack of data suggested it is not thought about in terms of Command and Control.

4.3.2.1.18 Gender Bias

CG1 was 1 of 5 female participants (CG1, LG3, P2, F3 and A2) and was the only one to raise gender issues. Whilst gender was not a specific research focus, nor was it a determinant within the sampling strategy this issue and although only raised once was worthy of note. CG1 noted differences throughout her extensive career in the perceptions of the same behaviour by male and female commanders, including her own. A male was viewed as commanding and direct (a

good leader), whereas a female was perceived as being bossy and controlling (a poor leader). This is significant and interesting, and will be picked up in the suggestions for future research.

4.3.2.1 Qualitative Themes – United States of America

27 themes were identified from the US data set through content analysis, which provided a useful snapshot of the key issues as defined by current US practitioners (Gibbs 2007, Neuendorf 2002).

4.3.2.1.1 Terminology & Concept Uncertainty

Issues regarding confused terminology, misunderstanding of key concepts and individual and/or organisationally specific interpretations of standardised policies and procedures were cited on 43 occasions and highlighted as a critical issue during emergency operations. Also, differing levels engagement with and implementation of NIMS/ICS was seen as being problematic.

4.3.2.1.2 Origins of Command and Control

All participants were aware of the military origins of Command and Control and linked ICS to California wildfires and FIRESCOPE. This theme was noted 24 times. Interestingly, S3 pointed out that ICS is strikingly similar to an earlier military management system and, LE1 felt that ICS developed post 9/11. Whereas both FR1 and FE3 took more historic perspective advocating that it originated from Moses and the Ten Commandments.

4.3.2.1.3 Leadership

Leadership was a key theme, cited 22 times, throughout the US interviews, with FE1, S2, LE1, LE2, FR1, FR2 and E3 highlighting its importance. Sub-themes raised included the need for a trained, experienced and respected leader. Whilst S2 suggested there is *"no democratic process in Command and Control"* on account of the military culture and backgrounds of his colleagues, which allowed for only limited discussion on decisions. LE1, LE2, FR1 and FR3 raised the issue of commander self-awareness in recognising their own limitations and how this can either help or hinder in terms of resource integration and multi-agency collaboration. Also, LE1 and LE3 were clear that leadership was not necessarily about rank.

4.3.2.1.4 Relationships

FE2, FE3, S1, S2, LE2, FR1, FR3, E1, E2 and E3 heavily cited the importance of relationships to effective Command and Control operations, which appeared on 21 occasions. The need to build relationships prior to a disaster was considered paramount. As was developing

relationships face-to-face rather than from a desk (LE2), as when you are competing for scarce resources relationships based on trust and respect can help resolve issues (S2).

4.3.2.1.5 Standardisation

FR1, FR2 and E3 all felt that ICS standardisation is generally working well across the US particularly within the Fire and Rescue community citing the theme 17 times. Though, FR1 pointed out that *"some states are doing it better than others".* S3 stated, *"I believe it is being achieved because we are seeing better responses",* though LE3 points out that Fire tend to have a better understanding of ICS than a State Trooper.

4.3.2.1.6 Command and Control is Essential

All 15 US participants felt that Command and Control was essential to emergency response operations. Views expressed ranged from a simple *"yes"* (FR1) to *"absolutely"* (S2, S3, FR3, LE1 and LE2) and *"it's the right thing to do"* (FE1): this was noted on 17 occasions. As a follow on question, participants were asked if there were any other ways of responding to disaster that didn't involve Command and Control. Responses ranged from no, to references to other civil and military Command and Control systems and participants laughing and saying it would be pandemonium and or chaos.

4.3.2.1.7 Tried and Tested

FE1, FE2, FE3, S1, S2, S3, all felt the existing model worked fairly well, citing 17 specific examples. FR1, FR2, FR3 and E2 also spoke positively of it though others were less effusive. FR1 for example stated *"well we teach a concept an error of infallibility and erm… which basically means it's not gonna happen here and if it does we'll take care of it"* demonstrating a confidence in the system's ability to cope with all-hazards and eventuality.

4.3.2.1.8 Training

Training was cited 17 times and forwarded as a significant factor though only by local first-responders, namely LE1, LE2, LE3, FR2, FR3 and E3. It was cited as something that works well, but as being burdensome on volunteers as they may not have time for the increasing state and federal competency requirements, which leads to lower recruitment and retention.

4.3.2.1.9 ICS is Command and Control

Participants FE1, FE2, S1, LE2, LE3, FR2, FR3, E1, E2 and E3 all directly referred to ICS when questioned about Command and Control, and this was directly noted on 16 occasions. For example E2 stated *"what I think of is the Command and Control, I think of the ICS model"* or FR3 who said *"we always equate everything to our Incident Command System in that erm*

Command and Control to us is erm coming up with erm objectives strategies and tactics to employ for whatever the emergency is at hand". This suggests that ICS has become synonymous with Command and Control and is viewed as being one and the same.

4.3.2.1.10 Coordination as Opposed to Command

The view that emergency response was more about coordination and support for the local level was expressed by S1, S2, LE1, LE2, and E1, and noted 16 times. This was particularly so when discussion around federal and state support, and the deployment and usage of both state and federal Incident Management Assistance Teams (IMAT). Also, the federal and state participants were very clear that they do not take command of local incidents rather they provide support if assistance is requested.

4.3.2.1.11 Order out of Chaos

S3, LE1, LE2, LE3, FR1, FR2, E1, E2 and E3 all felt Command and Control was necessary to establish order out of chaos, citing this view 13 times. LE1 stated *"Command and Control in my mind is basically making order out of chaos"* and S3 advocated, *"it's essential… absolutely… erm without it all you would have is chaos"* indicating the strength of feeling.

4.3.2.1.12 Communications

Communications was cited as a key issue 13 times, though it was a recurring theme throughout all transcript narratives. Though participants FE3, LE2, LE3, E1 and E2 spent considerable time focused on this issue. The central focus was on the need to improve multi-agency communications through enhanced technical capability; indeed LE2 highlighted failed grant programmes which have cost millions of dollars to simply change equipment rather than enhance capability, though E2 pointed out that significant advancements have been made over the past decade.

4.3.2.1.13 Who's in Charge?

FE3, S1, S3, LE2, LE3, FR1, FR2, E1 and E3 all voiced concerns over jurisdictional issues affecting multi-agency emergency response operations. The primary issue was law enforcement either taking over or fighting for *"control"* between each other or the FBI simply taking charge of everything. The issue of resolving overlapping jurisdictions via unified command and freelancing when nobody is in charge were also raised. This theme was noted on 12 occasions.

4.3.2.1.14 Scale

The concept of scale was an important feature of the discussions with FE2, S2, S3, FR1, FR3, E1 and E3, and was noted 12 times. S3 pointed out that *"I can easily envision where a catastrophe can be so enormous or could be so enormous that it would overwhelm the system"* suggesting that the current framework has limitations. E3 highlighted limitations within exercising regimes *"I think we need erm…. especially in the state of Maine I think we need to exercise an incident that is beyond our beliefs beyond our imagine-ability"* suggesting that boundaries of scale need to be extended in order to learn more about the current framework's capabilities. Also, FE2 stated *"you would think that in in a disaster environment it (span of control) might get bigger but it's actually smaller"* highlighting that as the disaster gets bigger the more personnel the system requires to operate.

4.3.2.1.15 Resources

Resource need was a significant issue; delays caused by time and distance were noted by FR3 who said *"one thing about the states here if you need stuff it will be provided it may not be very quick but it'll get there eventually".* Also, the difficulties of allocating finite resources was raised by FE1 *"we might have a lack of resources on the federal side and we are going to have to adjudicate those based on life saving life sustaining so Massachusetts you're not in dire need of… of this resource you need it but you're not in dire need and I only have a finite amount such as search rescue"*. Resource issues were cited by FE1, FE3, S1, LE1, LE2, FR1, FR2, FR3 and E2 highlighting the more national focus and resource availability, through both federal and the inter-state EMAC system. Although, LE1 felt that *"if you're drawing resources from all over the country then I just think it ought to be a federalised debt"*. Specific thematic examples were noted 12 times.

4.3.2.1.16 Political and Senior Command Direction/Interference

Issues such as the separation of the Church and State were raised (S2), and the influence of political figures and political motivations on response operations (S2, FR1, FR3 and LE3) was deemed a critical and sometimes disruptive factor. Ignorance in terms of knowledge gaps, lack of understanding by senior officials, partner agencies and senior commanders were cited as both a frustration and a mission success inhibitor: these issues were raised on 12 occasions.

4.3.2.1.17 Silo Mentality (Lack of Integration)

Local responders, namely LE1, LE3, FR1, FR2, E1 and E2 cited significant issues with silo working 12 times. Particular issues included cultural differences between law enforcement and the fire fighters. LE1, LE3, FR2, E1 and E2 all cited examples of information not being shared within or between agencies, which in some cases has led to deaths in the line of duty. Also, rivalries or ego-driven decisions where the Incident Commander refused assistance and did not delegate tasks were frequently cited.

4.3.2.1.18 Single Loop Learning

FE2 stated, *"we do something we have an after action that goes along with but I don't think we ever actually sit back and say… I think in the after action we say you know what did we do well and what could we have done better but I don't that we step back and say systematically what worked well systematically and what could we to change the system to do better I don't think we ever do that".* FR2 said *"death dictates what we do… you know we have to kill a lot of people for them to change a standard and things over here and you know when you start killing fire-fighters for the same thing over and over again and… the post incident analysis is pointing to a Command and Control breakdown it doesn't take long for the federal government to step in or training programmes to be offered".* However, despite visceral failures such as Hurricane Katrina Command and Control has yet to be fundamentally reviewed suggesting that a single loop learning process is operating. This theme was noted on 11 occasions.

4.3.2.1.19 Flexibility

FE1, FE2, S2, LE1, FR1 and E3 all expressed positive views about the flexibility of the ICS/NIMS system citing the ability of the model to expand and contract depending on the needs of the incident. However, FE1 pointed out that *"you have to adhere to the strict organisational structure even though it might not be the optimum way to address the situation"* and S2 advised that *"Command and Control… needed but erm with reservations… always needed but applied carefully but judicially… and not one model fits all situations"* both questioning the seemingly flexible nature of the model. This theme was noted 9 times within the transcripts.

4.3.2.1.20 Contradicts Academia

Comments, noted on 8 occasions, made by S1, S3, LE2, LE3, FR1, FR2 and FR3 contradicted academic perspectives noted in the literature review. The most frequent contradiction related to the NIMS/ICS requirement for 1 person to be in charge of everything (though with responsibilities delegated under span of control), which the aforementioned participants noted as critical to the system's success. Quarantelli (2002) (p 1) argues that it is *"unrealistic to think anyone at the height of a crisis could be "in charge" given the lack of information, conflicting and incorrect rumours, and the diversity of the many groups involved in such situations"* citing the views of disaster researchers over a period of 40 years, highlighting the polarised nature of academic and practitioner views in this area.

4.3.2.1.21 Alternatives to Command and Control

Participants FE2, S2, S3, FR1 and E3 raised 8 notable points and engaged in further discussion that suggested potential for alternative models of emergency response. FR1 discussed civil defence and medieval combat units operating autonomously as a potential method for

decentralised bottom-up emergency response organisation. S2 advocated a capacity building process with the goal of ensuring that every citizen is self-reliant and resilient, as this would negate the requirement for Command and Control based emergency response, though this was an aspirational rather than realistic idea. An idea for a Virus/Antidote styled organisational model derived from Morgan's Organism metaphor emerged during the FE2 interview and was subsequently discussed (as it was relevant to the conversation) in the S3 and E3 interviews, and is built upon in chapter 6. However, FE2 pointed out that that *"the struggle that you will have is if you come up with a system other than Command and Control that works because because it is firmly entrenched in the way people think it will be difficult to get them to change",* highlighting the centrality of existing practice.

4.3.2.1.22 Grant/Money Focus

LE2, FR1, FR2, FR3 and E3 raised concerns that ICS/NIMS training was often only being undertaken to secure grant funds: which was noted on 8 occasions. Consequently, the principles are seemingly not being fully adopted and, as LE2 pointed out, some agencies have fought implementation. E1 highlighted the issue of private sector buy-in to NIMS/ICS, the *for-profit* nature of many US hospitals means it can be very difficult to get personnel to take time away from their day job to undertake training and exercising.

4.3.2.1.23 Top-Down Containment

FE1, LE2, LE3, FR1, FR3 and E1 framed Command and Control in a manner that indicated a top-down perspective associated with traditional views on the model, which was noted on 7 occasions.

4.3.2.1.24 Emergent Resources

The issue of the use of emergent resources was raised by S3, LE1 and FR1, which was noted 7 times. S3 stated *"you're talking about what we call spontaneous volunteers and of course the whole thing with spontaneous volunteers unless you know that individual you don't know that individual you don't know whether they're a pretending to be an EMA Director or whether…"* though despite doubts he felt that emergent behaviour would probably happen in large-scale disasters anyway. FR1 highlighted an earlier incident during which isolated communities implemented their own Command and Control arrangements, self-organising and managing locally. LE1 referred to convergent volunteers, though in his own words, pointing out that this phenomenon tends to occur a few days into disaster response and as you don't have time to check their credentials you can either engage with and utilise the resource or try to restrict their activities, which ties up finite resources.

4.3.2.1.25 Requirements on Responders

FR2 and E2 voiced issues concerning requirements placed on responders, firstly in terms of the perceived over-regulation of the requirements to become a volunteer first-responder, plus the significant investment in time and training to maintain the requisite level of competence, and then the actual stresses and of dealing with emergencies then returning to your day job. These were seen as significant barriers to recruiting and retaining volunteers which make-up a considerable portion of local resources. Also, the need for responders to know that their families are taken care of when disaster strikes was raised by FR1 as this was thought to reduce the likelihood of personnel not reporting for duty. This theme was raised 3 times.

4.3.2.1.26 Multiple Roles

LE2 and E3 pointed out that at the local level in the US it is commonplace for emergency responders to be multi-hatted in that many local responders join more than 1 agency, which is less common in the UK. Indeed, within the US sample-frame, LE2, LE3 and E3 were all serving law enforcement, EMS and fire fighters at one time and LE2 was active duty military and, at the time of the study, a County Emergency Management Director. This theme was raised twice.

4.3.2.1.27 Non-Integration of Recovery

FE2 and S2 were the only participants to engage in discussion of the recovery phase and the National Disaster Recovery Framework (NDRF), which is an important and integrated part of the US disaster response policy framework. FE2 discussed the recent appointment of a Federal Disaster Recovery Coordinator (FDRC) highlighting the primacy of the Federal Coordinating Officer (FCO), whereas S2 suggested that recovery is more integrated than it has been in the past. However, the significance was not what was said but rather what was not. Though an integrated element of the US Command and Control framework its omission from 13 of 15 US transcripts suggests it is not considered as such.

4.3.3 Qualitative Themes and Selected Quotes

4.3.3.1 Command and Control is Essential

Fig 4-4: Command and Control is Essential Quotes		
Participant	**Country**	**Quote**
F1	UK	*"I don't think it's useful it's essential"*
CG3	UK	*"Erm unequivocally yes"*
F2	UK	*"Oh yes, very much so, erm, in fact I would stick another word into your question, is it a useful integrated emergency management tool?"*
P3	UK	*"Yes (laughing) essential yes"*

FE1	UK	*"I think knowing… the whole organisation knowing that it's the right thing to do"*
FE3	US	*"(Laughing) yep absolutely I don't think there's any question that it's almost like erm the engineer on the ship if he's doing his job erm all things are going well and you have that capability nobody really thinks about it but if he's if he's got a capability is deficient erm everybody is complaining and I'd make that analogy to erm Command and Control"*
S3	US	*"It's essential… absolutely… erm without it all you would have is chaos"*
LE2	US	*"Oh yea absolutely"*
FR1	US	*"We're paramilitary to start with so it's paramount you have to have Command and Control because in our business people get hurt and killed if you don't… we have term we call freelancing and freelancing is what gets people killed erm and so we have a very strong accountability system"*
FR2	US	*"It is I've… I've had the experience to be on Departments when I first started that had no Command and Control that had no policies in place had no training erm and I saw how much a free-for-all it was erm how dangerous it was how poorly the incidents were managed erm how long it took to take care of the incident typically took longer"*

4.3.3.2 Order Out of Chaos

Fig 4-5: Order out of Chaos Quotes		
Participant	**Country**	**Quote**
CG1	UK	*"(The purpose of Command and Control) Erm to bring some kind of order out of the chaos"*
LG2	UK	*"You have to have management or there would be chaos"*
P3	UK	*"Without Command and Control is unilateral action by people who erm human nature takes over erm some of the more rationale erm objective decision making tends to go out the window and people act on impulse which can lead them to more danger or inadvertently putting other people into more danger as well"*
E2	UK	*"The purpose is trying to maintain some sort of organised chaos"*

E2	UK	*"I would say is turning the chaos into coordinated chaos. It is really the ability to coordinate chaos, chaos situation"*
S3	US	*"Well I think it's to bring order to what would otherwise be chaos to put it very simply but it's to keep the organisation moving in a specific direction because all individuals have their own views their own perspectives their own priorities if there isn't somebody there to set them on a course they will go on their own course and that that would not lead to I believe a successful outcome"*
LE1	US	*"Command and Control in my mind is basically making order out of chaos"*
LE2	US	*"To prevent chaos"*
FR1	US	*"Command and Control not only has to be just one person you got to make sure you've got that line of succession so that there's always somebody people can look up to for direction and without erm then you're gonna have chaos"*
E1	US	*"Because if you don't have someone in charge you are gonna have a breakdown of order"*

4.3.3.3 Terminology and Concept Uncertainty

Fig 4-6: Terminology and Concept Uncertainty Quotes		
Participant	**Country**	**Quote**
CG2	UK	*"We are human beings and in that we can still be prone to erm understanding perhaps terms and erm certain aspects of our documents slightly differently than others"*
CG2	UK	*"The whole terminology and lexicon-ology of the terms in resilience community is bonkers absolutely just crazy stuff and erm I find it very difficult to sometimes to erm get a grasp on what people talk about in meetings and I have to constantly ask them so I think that remains an issue"*
P1	UK	*"Fire expectations are that silver will be at the scene whereas ours isn't, ours invariably unless there are exceptional circumstances will be in a control room"*
F1	UK	*"We've had some difficulties with but probably have sorted now erm is the different interpretation of silver command between agencies"*

F2	UK	*"It's this lack of knowledge of what silver command is about, and it's how you liaise. The structure of bronze, silver, gold was that my bronze commander was my sector commander (on scene). I was silver being in command of silver command on scene and gold command was set up at Aykley Heads (Police Headquarters)"*
A2	UK	*"Sometimes we don't speak the same language we're talking in different systems and we should be we've got one common goal and we're not speaking the same language"*
FE1	US	*"In Louisiana in Katrina the state did not understand ICS we didn't at the federal end we didn't adhere to ICS our fellow federal agencies did not not understand ICS at the time"*
FE2	US	*"The bad part of the operation was erm the fact the fact that our defense forces at that particular moment erm had no familiarity they had with the ICS construct a strictly DOD system"*
S1	US	*"We do it a little differently here than is down in some other places we have you know some subtle nuances that area little different not terribly different"*
S2	US	*"We could go down various models of Command and Control because there's so many of them"*
LE2	US	*"The problem that I see is that a lot of organisations don't follow the same interpretation of ICS as others do so I feel that if you've got to instruct ICS it should be all the one standard so when you do get deployed out of your region you can have that continuity"*
FR2	US	*"They don't use standardised terminology they still use ten-codes… are you familiar with ten-codes… so one agency might have ten-eighteen as this thing and another one is thinking it's something else but the Fire Service in Maine and across this country is way more advanced in my experience"*

4.3.3.4 Standardisation

Fig 4-7: Standardisation Quotes - Positive		
Participant	**Country**	**Quote**
A1	UK	*"You know that we all understand what Command and Control is"*
S3	US	*"(Standardisation) I believe it is being achieved because we are seeing better responses"*

LE2	US	*"The National Incident Management System is a nationwide system so whether we're here or we end up out of state some place we have to know the same terminology so we'd have to use the same terminology"*
LE2	US	*"What works for well for us in Command and Control… I guess the fact that erm all of of our communities are buying into the ICS system and that makes it a lot than when in the past when went there and you had a Fire Chief or a Police Chief who didn't believe in the ICS system and then you came in there and you were using terminology and they're looking at you like you're speaking some other language"*
FR1	US	*"Command and Control in the United States right now is focused upon the the formation of a command at the emergency or emergencies and then the command grows up to the government level as necessary… and it's nationwide this is another thing we've finally come up with a system that's a nationwide system so that no matter where you go the rules of engagement are the same"*
FR3	US	*"In the states the fire agencies being the US Forest Service and the Bureau of Land Management are very much in tune with how the Incident Management System works the beauty part of that is that where it works very very well is it's a nationally recognised system where as somebody from the state of Maine can integrate in the same way as someone from the state of Alaska we're speaking the same language we're using the same terminology and it works very very well"*
FR3	US	*"What works well is the fact that it in our country using ICS it's for the most part erm its multi-jurisdictionally accepted… accepted across jurisdictional political lines "*
Standardisation Quotes - Negative		
Participant	**Country**	**Quote**
FE1	US	*"To a certain extent erm the states are basically content to go along erm there are various levels of expertise and that's based on how the Governor and state legislature want to support emergency management so it varies from state to state"*
LE3	US	*"I think that if we're gonna teach ICS it needs to be standardised across the country and there should be no room for interpretation you know what I mean you can't say if you teach it this way down here and you teach it this way up here when you get calls in the middle well who's gonna agree and*

		who's gonna do… cos they're gonna be doing it how they were trained"
FR1	US	*"Even though it sounds nice all fifty states have adopted this and everything I'm here to tell it's not being implemented equally alright some states are doing it better than others"*
E3	US	*"We've taken the previous adapted to our own and and sort of come up with what works for us"*

4.3.3.5 Training

Fig 4-8: Training Quotes		
Participant	**Country**	**Quote**
LE1	US	*"Another thing that doesn't work real well in it is erm… you can train people to death in it you can send then to courses for 100 200 300 400 700 800s online but you know until really put yourself in an incident it's kind of erm pie in the sky sort of stuff you know you can sit there and look at it there and say I've got the org chart down I'm all set now you know but until you really put yourself in the middle of an incident you really don't understand how it works and you don't get a grasp of how it works which is why we are sending everybody to that 314 course in College Station because it's scenarios it's hands on scenarios"*
LE2	US	*"That's what the Incident Command System helps with talking to someone who has some training my comm guys I have a comm I have a HAM operator… (he says)… I'll help you I'll do you whatever you ask just tell me… I'll go… look all I want you to do is I want you to go take this course called NIMS 100 and 700 it's… just do it online at your leisure and they're like I'll help you I ain't interested in… I'm sorry I need you… if you come to me and I'm at the scene of something the Chief says alright I need this this and this and I look at my team and go I should be able to point at my team leader and go this is what they need take care of it… but I get a guy who's doesn't want to do the training but he wants to help he gets there and I'm a HAM operator… cool are you on the team… no… well thank you very much for coming"*
FR2	US	*"They're volunteers they struggle just to be able to put the time in to go to fires calls and car accidents they don't have the time*

		they don't have the interest and erm you know it's kinda like erm it's not gonna happen here so why should I bother"
E3	US	*"What works well erm so training works well we have tonnes of erm the ability… we have lots of opportunities… we have tonnes of opportunities to train we have have many opportunities to exercise"*

4.3.3.6 Summary of Content Analysis

Content analysis identified 45 themes, 18 UK and 27 US respectively. These themes contributed to the achievement of Objective 3, which sought to *"produce linguistic and visual data that encapsulates emergency management practitioner's views on Command and Control"*. In doing so, these rich qualitative findings provided vital context to the metaphor analysis, which formed the crux of this study. In both data sets the primary content analysis theme was terminology and concept uncertainty, which indicated that miscommunication, misinterpretation and misunderstanding of key terminology and concepts regularly occur in both countries questioning the notion of NIMS/ICS standardisation (Jensen and Youngs 2015). The importance of relationships as the basis for effective multi-agency operations, strong leadership and a clear understanding of the origins of the ICS were key themes for US participants. Conversely, the importance of scalability within the UK framework, the essential nature of Command and Control, and indicators of a single loop learning process were evidenced within the UK data set.

4.3.4 Linguistic Metaphor Findings

These findings addresses Objective 4, which intended to *"identify linguistic and visual metaphors of Command and Control used by UK and US emergency management practitioners".*

4.3.4.1 Linguistic Metaphor Usage - United Kingdom

Fig 4.9 and 4.10 below provide a synopsis of the UK and US linguistic metaphor findings. The UK source qualitative data including full quotations can be found in Appendix 6 and the US data in Appendix 7. The Linguistic Metaphor Fig 4.9 and 4.10 are each split into 3 sections; Section A contains the general linguistic metaphors found. This includes the thematic metaphors drawn from the Master Metaphor List (Lakoff, Espenson and Schwartz 1991), and Morgan's metaphors (Morgan 2007). Please note, other general metaphors occur in natural language, these were differentiated from similes and idioms through the use of Steen's (2007, 2010) (p 3) Metaphor Identification Process (see Appendix 8), which necessitated the creation of a general code to enable this valuable data to be included in the analysis (Foster 2012, Glucksberg 2001).

The User Codes identify which participants expressed each metaphor and the count indicates the total number of participants for each given metaphor for ease of reading. Reflecting the qualitative nature of the study, the focus was not on the number of times each metaphor was used rather the breadth of its use across multiple organisations. For a metaphor to be considered significant it must have been used by a minimum of 3 agencies (triangulation) to appear within the table (Bryman and Bell 2011) (p 402). The rationale here is that emergency management is inherently multi-agency and for the findings to be applicable to the development of communicative tools the selected metaphors need broad organisational meaning. In this sense, whether a metaphor is used once or 10 times is not overly relevant as its singular presence denotes a level of cognitive understanding, meaning it has the potential to be used as the basis of a communicative mechanism to develop a greater shared-understanding across organisations. Though, the most used metaphors are prime candidates for development as they are more likely to have greater multi-agency resonance.

Section B provides an overview of participants' usage of Morgan's metaphors within the interviews. Similarly, it is the breadth of use that is focused upon rather than quantitative frequency. Section C, details the metaphors used to describe the respective Command and Control frameworks. A narrative to give context supports each metaphor, and user codes identify which participants expressed the metaphor. The metaphors within these tables form the conceptual basis of communicative tools that enhance understanding of Command and Control developed in chapter 6, and constitutes a significant part of this study's contribution to knowledge.

Fig 4-9: Linguistic Metaphors – United Kingdom					
Section A: Common Multi-Agency Metaphors					
Metaphor		**Source**	**User Codes**	**Count**	**Tri**
1.	Status is Position	Master List	CG1, CG2, CG3, LG2, LG3, P1, P2, P3, FE1, FE2, FE3, A1, A3	13	Y
2.	Natural World	General	CG1, CG2, CG3, LG1, LG3, P3, F1, F2, A1, A2, A3	11	Y
3.	Construction	General	CG1, CG2, CG3, P1, P2, P3, F1, F2, A1	9	Y
4.	Acting is Feeding On	Master List	CG2, CG3, LG3, F1, F2, A1, A2, A3	8	Y
	Games and Play	General	CG1, CG2, CG3, LG3, P2, F1, F2, A2	8	Y
5.	Progress is Forward Motion	Master List	CG2, CG3, F1, F2, F3, A2	6	Y
	Conducting Research is Solving a Puzzle	Master List	CG3, LG1, P2, P3, F1, A1	6	Y
	Navigation	General	CG1, CG2, CG3, LG1, P1, F1	6	Y
6.	Cooking	General	P2, P3, F1, F2, A3	5	Y
	The Mind is a Container for Objects	Master List	CG1, P2, P3, F1, A1	5	Y
7.	Clothing and Shopping	General	CG1, CG2, F2, A3	4	Y
Section B: Usage of Morgan's Metaphors					
Metaphor			**User Codes**	**Count**	**Tri**
1.	Culture		CG2, CG3, LG1, LG2, LG3, P1, P2, P3, F1, F2	10	Y
2.	Organism		CG3, P3, F1, F3, A1, A3	6	Y
3.	Machine		CG2, LG2, LG3, P1, P2, A2	6	Y
4	Flux and Transformation		CG2, F3, A2	3	Y
	Political System		CG1, CG3, F1	3	N
5.	None		A3	1	N
Section C: Command and Control Metaphors					

Metaphor	Context	User Codes	Count
Precious Metals	The Gold, Silver and Bronze levels within the Command and Control framework are value-laden the higher the level the more value it has	CG1, CG2, CG3, LG1, LG2, LG3, P1, P2, P3, F1, F2, F3, A1, A3	14
Spinning Plates	The various tasks within Command and Control are seen as plates, which must be continuously spun and balanced. The metaphor was primarily used to refer to emergency response activities at the tactical and operational levels	CG2, CG3, P3	3
Herding Cats	A derogatory reference whereby partners agencies are likened to feral cats that lack discipline and tend to wander off in their own direction, and the commander must try and herd them like animals	A1, CG2,	2
Golden Thread/Thread	The levels within the Command and Control framework are bound by a golden thread which must be protected and sustained, and if cut the system dies (a reference to the thread of life). A secondary usage of this metaphor was used noted: an incident was conceptualised as a piece of string and the "threads of an incident could start to unravel" without effective Command and Control	F1	1
Banging your Head Against a Wall	A derogatory metaphor expressing frustration with multi-agency decision making processes and internal managerial interference with operations	A2	1
Please see Appendix: 6 which details all linguistic metaphors found within the UK transcripts			

The metaphors contained in Fig 4.9 Section A provided a rich insight in to the natural language used by the 15 UK participants to express their interpretations of emergency management beyond just Command and Control. Thus, the 11 triangulated metaphors (from a total of 44 induced) represent verbal tools that can be used to convey deeper meaning and understanding. The top ranked metaphor was Status is Position (*senior command is **up**; lower command is **down** or on the **ground***) used by 13 participants. Natural World metaphors (*it's gone back into its **shell***) ranked 2nd being used by 11 participants. Construction related metaphors (hammered home) ranked 3rd. In joint 4th was Acting is Feeding On (***feeding** the command picture*) and Games and Play (***step up to the plate***) metaphors, which were used by 8 participants respectively. The joint 5th ranked metaphors were Progress is Forward Motion (*the organisation is **moving forward***), Conducting Research is Solving a Puzzle (*situational awareness as **building pieces of the puzzle***), and Navigation (***on the right track***) used by 6 participants. The 6th ranked metaphors were Cooking (***carving up** the operation*) and the Mind is a Container for Objects (*only so many things you can **fit into one human head***) used by 5 participants. The final triangulated metaphor was Clothing and Shopping (*I moved from Fire to Police so I'm **wearing a different hat***) used by 4 participants.

The findings in Section B show that that Morgan's Culture metaphor appeared in 10 transcripts, Organism and Machine in 6, Political System and Flux and Transformation in 3, and 1 transcript contained no expressions of Morgan's metaphors at all.

Section C contains 5 distinct metaphors of Command and Control. The most dominant was Command and Control as Precious Metals, which reflects the Gold Silver and Bronze levels of local command within the UK framework, which was used by all but 1 participant, A2. The remaining metaphors; Spinning Plates was used by 3 participants, Herding Cats by 2 and the Golden Thread and Banging Your Head Against the Wall metaphors were each used by only 1 participant. A narrative of each metaphor has been provided and these ideas are revisited in chapter 6.

4.3.4.2 Linguistic Metaphor Usage – United States of America

Fig 4-10: Linguistic Metaphors – United States of America

Section A: Common Multi-Agency Metaphors

	Metaphor	Source	User Codes	Count	Tri
1.	Status is Position	Master List	FE1, FE2, S1, S2, S3, LE1, LE2, LE3, FR1, FR2, FR3, E1, E3	13	Y
2.	Progress is Forward Motion	Master List	FE2, S1, S2, LE3, FR1, FR2, FR3	7	Y
3.	Cooking	General	FE1, S3, LE2, LE3, FR1, E1,	6	Y
	Obstacles to Action are Obstacles to Motion	Master List	FE3, S1, S2, FR3, E2, E3	6	Y
4.	Ideas are Constructed Objects	Master List	LE2, FE2, FE3, S2, E3	5	Y
5.	Games and Play	General	LE1, LE2, FR1, E3	4	Y
	Good is up (Derivative of Status is Position)	Master List	S2, LE1, LE3, E3	4	Y
	Conducting Research is Solving a Puzzle	Master List	FE3, S2, FR1, E2,	4	Y

Section B: Usage of Morgan's Metaphors

	Metaphor	User Codes	Count	Tri
1.	Culture	FE3, S2, S3, LE1, LE2, FR1, FR2, FR3, E1, E2, E3	11	Y
2.	Political System	FE2, FE3, S2, LE2, LE3, FR1, FR3, E3	8	Y
	Organism	FE1, S2, LE2, LE3, FR1, FR2, FR3, E2	8	Y
3.	Machine	FE2, FE3, S1, FR3, E1, E2	6	Y
4	Instrument of Domination	FE1, S2	2	N
	Flux and Transformation	FE2, FE3	2	N
5	Psychic Prison	FE1	1	N

6	None		0	N

Section C: Command and Control Metaphors			
Metaphor	**Context**	**User Codes**	**Count**
Candle	Command and Control arguably perpetuates a bigger the disaster a throw more resources perspective criticised by the work of Quarantelli (2006), Lagadec (2007) and Bissell (2013) amongst others. Following the UK field-study the author developed a metaphor where Command and Control is likened to using a candle to provide increasing amounts of light rather than using other technology such as oil lamps and electricity to articulate limitations of and single loop learning around Command and Control usage in disasters and catastrophes.	All participants (Author inject)	15
Virus/Antidote	Organism metaphor derivative that provides a theoretical alternative to existing Command and Control systems – a decentralised autonomous bolt on to ICS/NIMS	FE2, S3, E3 (Author inject)	2
Please see Appendix: 7 which details all linguistic metaphors found within the USA transcripts			

The metaphors contained in Fig 4.10 Section A provide an overview of the metaphorical language used by the 15 US participants to convey their views. The 8 triangulated metaphors (from a total of 49 induced) are considered significant within section B of the findings. Similarly to the UK findings, the top ranked US metaphor was Status is Position and was used by 13 participants. Progress is Forward Motion metaphors (*Looking **down the road**, don't get tunnel vision you wanna look **ahead***) ranked 2nd and was used by 7 participants. Cooking related metaphors (*I suppose it could be **boiled** down to I'm senior to you*) ranked joint 3rd with the Obstacles to Action are Obstacles to Motion metaphors (*we had a centralised reporting system which allowed us to **push** the communication out to services*), noted in 6 transcripts. In 4th was the Ideas are Constructed from Objects metaphor (*so let's call a unified command and so… just **building**… based on based on resources based on the need of what is actually needed for that event*) used by 5 participants. In joint 5th appearing in 4 transcripts were the Games and Play (*step up to the plate*), Good is Up (*the **up side** of emergency management in this country is that each that each level of government is somewhat independent of the other the **downside** is that each is each level is somewhat independent of the other, there you go*) and Conducting Research is Solving a Puzzle (*certainly NIMS and ICS are the key… the key **pieces** erm in in the Command and Control **picture***). The findings in Section B illustrate that that Morgan's Culture metaphor appeared in 10 transcripts, Political System and Organism in 8 and Machine in 6. Instrument of Domination and Flux and Transformation appeared twice respectively and Psychic Prison once. No US participant selected the None of the Above option. Section C contains 2 Command and Control related metaphors, namely the Command and Control as a Candle which offers a critique of existing models and the Virus/Antidote perspective, offering the potential for new or alternative ways of conceptualising emergency response operations which is developed in chapter 6.

4.4 Individual Linguistic Metaphor Findings

The sections below provide examples of participants' usage of individual metaphors drawn from the interview transcripts.

4.4.1 Shared Metaphors

This section provides examples of the 5-shared metaphors.

4.4.1.1 Status is Position

Lakoff, Espenson and Schwartz's (1991) Status is Position metaphor was the most commonly found appearing in 26 of 30 transcripts (13 UK and 13 US) thus it was widely understood as it was used by all but 4 participants. It refers to the status of a group or individual being related to their relative height for example *"he ranks above me"* or *"they are low class"* (Lakoff, Espenson and Schwartz 1991) (p 58). Relevant examples are shown in Fig 4.11 below:

Fig 4-11: Status is Position Quotes		
Participant	**Country**	**Quote**
CG1	UK	*"If I work from the **top down** (laughing) which maybe isn't the way a lot of others see it obviously we have COBR Cabinet Office Briefing Room"*
CG2	UK	*"It was really easy as Head of Resilience to put the plans action into place so that was about bringing people together bringing Resilience Advisors together erm knowing what was going on **on the ground**"*
CG3	UK	*"The PM (Prime Minister) to the PC (Police Constable) **the very very top to the very very bottom** of the span"*
LG2	UK	*"COBR for example if you had a situation where there was a fire in Durham and suddenly the instructions came from **on high** London for example"*
LG3	UK	*"The sort of the go ahead or the referral **upwards** if you like is quite clear (authorisation to act)"*
P1	UK	*"You've got your chief execs so **below** me in the gold (Police Gold Commander referring the Gold Command)"*
P2	UK	*"Being a bronze and then they **step up** to silver"*
P3	UK	*"On the **ground** (frontline responders)"*
F1	UK	*"It's fair to say that those relationships as you go **up** become more up the command levels between gold sorry bronze silver and then gold as you go **up** the personal the getting to know the individual commanders is possibly more important or more vital or beneficial "*
F2	UK	*"People moving **up** to gold and **dipping back** to silver"*
F3	UK	*"Worked my way **up** to erm Watch Manager (height equals success)"*
A1	UK	*"I was sat at gold I would expect a tactical plan to come **up** and for me go fine sign it date and send it back **down** saying initiate that plan"*
A3	UK	*"Sometimes a **higher** level for instances if COBR is getting involved"*
FE1	US	*"He (FEMA Administrator) will in turn delegate certain authorities **down** to the regional administrators*
FE2	US	*"Each group **underneath** that has a span of control under it so that it is basically a pyramid effect "*

S1	US	*"The various components all the way **up** through the federal level"*
S2	US	*"What works well is the willingness of different levels of government to help the lower level of government when in need"*
S3	US	*"You might have a local EOC or **above** that level you might have a county EOC"*
LE1	US	*"People come in from the entry level and they progress **up** through"*
LE2	US	*"All I care about is when the Incident Commander is who the heck is in charge of that you know he's got the list of **underneath** him of all the people so I say to him get this done and he goes okay and he tells these people this is what they need to do"*
LE3	US	*"By the time it gets **down** to the local level there is so much area for… or scope for misinterpretation or interpretation depending on your view that we have over one county to the next slightly different approaches to something that should just be very simple"*
FR1	US	*"It will always defer **down** to the next senior person"*
FR2	US	*"Our fire fighters embrace it they understand it they're eager to use it younger fire fighters are eager to get **up** into that role cos they… there's definitely the leadership component to it"*
FR3	US	*"I've been with the department for 22 years and I've worked very hard erm starting at the… in the wildfire world starting at the end of a shovel erm and I've worked my way **up** to be a Senior Manager in and a Senior person in our Incident Command System"*
E1	US	*"I oversee all the Command and Control **on the ground**"*
E3	US	*"I observe Command and Control on that **rung** when I'm sitting out back at the Operations Desk… the Emergency Operations Center"*

4.4.1.2 Progress is Forward Motion

Lakoff, Espenson and Schwartz's (1991) Progress is Forward Motion metaphor was the 5th and 2nd most commonly used within the UK and US findings. It's meaning is conveyed by relative motion; it is a derivative of the Change is Motion metaphor where the source domain is the motion and target domain is the change of state, for example *"we fall back 2 steps for every 1 we take"* or *"things are at a standstill – no progress is being made"* (Lakoff, Espenson and

Schwartz 1991) (P 16). Fig 4.12 below provides a range of quotes that illustrate usage of the Progress is Forward Motion metaphor by the sample-frame:

Fig 4-12: Progress is Forward Motion Quotes		
Participant	**Country**	**Quote**
CG2	UK	*"Just understand the situation is understand what you've got to do and then just step back 10 minutes isn't gonna make a difference certainly at my level erm you know the actions already starting to happen at local level and if you just **step back** it's fantastic so it's letting people get on with what they should do"*
CG3	UK	*"We would dearly like to see proposals go **forward** how the collective the LRF can consider how we will in informational terms support the SCG"*
F1	UK	*"So there needs to be that learning loop in place as well so that the organisation are **moving forward** erm and that again feeds* all the way back through "*
F3	UK	*"They built them a home from home over there which it was sort of a **backwards step** really"*
A2	UK	*"We're going in to erm **back** to the way we were"*
FE2	US	*"It was trying to **catch up** in terms of what their responsibilities was who they were answerable to and how it was supposed to go **forward**"*
S1	US	*"We knew **ahead** of time"*
S2	US	*"We weren't there **back** in the day we can talk about it all we want"*
LE3	US	*"It's sad in this day and age after Katrina and 9/11 I mean in all these incidents and… it's almost almost like they're **going back** to where it was before and I just cringe because we're better than that"*
FR3	US	*"They often fail to think of the fact that there's a lot of other things that are required erm in order to keep the operational side of an incident **moving forward**"*

4.4.1.3 Cooking

Cooking related expressions were the 1st general category metaphors found in both the UK and US findings. This category was designed to be extremely broad to capture all linguistic metaphors that could potentially occur within the English language. As such the resulting metaphors were more generalised than either the Master Metaphor List or Morgan's metaphors.

Cooking is an accepted function of day-to-day life so it was not too unexpected that a common linguistic understanding occurred based on such expressions. Furthermore, their emergence matches the work of Tomlinson (1986) whose research noted metaphors of cooking used to explain writing processes. A sample of usage in the context of emergency management can be seen in Fig 4.13 below:

Fig 4-13: Cooking Quotes		
Participant	**Country**	**Quote**
P2	UK	*"If it starts to **bubble** activate Silver"*
P3	UK	*"You are **carving** up the operation into who's got the responsibility for what"*
F2	UK	*"Constantly kept **stirring the silver pot** (senior commanders interference)"*
FE1	US	*"It **distils** it down yep practical application"*
S3	US	*"I suppose it could be **boiled** down to I'm senior to you"*
LE2	US	*"We use what they call the 20 minute rule if you haven't effectively made some **steam** in this thing after 20 minutes you better start thinking about coming up with a different erm tactic"*

4.4.1.4 Games and Play

Similar to Cooking and also drawn from the general category, Games and Play are also an integral part of social life and human interaction thus such references are to be expected in natural language. These findings reflect McAllister's (2015) chess as a metaphor for intra-organisational politics, and Nisula et al's (2015) play as a metaphor of creativity. Games and Play ranked 4th and 5th in the UK and US findings respectively. Examples of its use can be found in Fig 4.14 below:

Fig 4-14: Games and Play Quotes		
Participant	**Country**	**Quote**
CG1	UK	*"You know our military colleagues who quite often say will you not **ask us to the party** because there may not be anything that we can directly do erm even though you might not be able MACA or whatever we still might be able to share our expertise"*
LG3	UK	*"Interoperability has been is described in NATO as a state of mind you can give people the train set but unless they are prepared to **play nicely together** with it then there's really no point"*
P2	UK	*"We had our little erm **scrum down** (multi-agency collaboration)"*

LE2	US	*"Now I don't have that resource I have to go find it so that's a whole different **ball game** for an emergency manger"*
FR1	US	*"You're dealing with the people who don't wanna play in the **sandbox**… remember I said the stupid and the ignorant individual"*
E3	US	*"You can do all the courses you like but unless you've experienced putting them into **play** it can be quite difficult"*

4.4.1.5 Conducting Research is Solving a Problem

The Conducting Research is Solving Problems metaphor ranked 5th in both the UK and the US and is drawn from the Master Metaphor list, an example of which is *"he finally got the pieces to fall into place"* (Lakoff, Espenson and Schwartz 1991) (p 134). Relevant examples are shown in Fig 4.15 below:

Fig 4-15: Conducting Research is Solving Problems Quotes		
Participant	**Country**	**Quote**
CG3	UK	*"But actually ensuring that the multi-agency the **bigger picture** was erm was achieved sustained and fed into"*
LG1	UK	*"It's just one slice of the **fuller picture**"*
F1	UK	*"The individual organisation **fits in with the big picture"***
A1	UK	*"Which is ignore what's going on on the ground and make sure the information is going back you know feed **the bigger picture**"*
FE3	US	*"Certainly NIMS and ICS are the key… the key pieces erm in in the Command and Control **picture**"*
S2	US	*"With resources in hand erm in line with statutes and regulations that support those resources erm statutes regulators or state government or US government agencies use that money for its intended purpose to in emergency management to save lives mitigate against property and erm recover from incidents and organise themselves for that intended purpose to lessen the effects of disaster response when we have to and recover as quickly as possible and prepare for all of that stuff all of the time and so they 5 those 5 mission areas that I mentioned earlier in order to do that prevention protection mitigation response recovery and folded into all those is preparedness so that's the **big picture** as I see it"*

FR1	US	*"Command and Control is understanding erm number understanding your role and the entire **picture**"*
E2	US	*"To show that how their role fits into the **bigger picture**, well I have seen somebody at their worst and I pick them up, don't realise it and I drop them off"*

4.4.2 Individual Metaphors – United Kingdom

The section below details examples of the 6 individual linguistic metaphors noted in the UK findings.

4.4.2.1 Natural World

The Natural World general category metaphor ranked 2nd and is a reflection of how the UK participants make sense of the world around them by referring to and conceptualising it by relating it to the natural environment surrounding them to ensure understanding. Fig 4.16 below offers a sample of quotes:

Fig 4-16: Natural World Quotes		
Participant	**Country**	**Quote**
CG1	UK	***"**An incredible amount of effort and time that goes into the planning and the operation itself and then hooray hooray nothing goes wrong so everyone breathes a sigh of relief and goes **back into their rabbit holes,** no one captures the learning so you start all over again and actually I think we're very good we're better at learning when the shit hits the fan"*
CG2	UK	*"I think it's actually gone back **into its shell** I think because we've had austerity people have lost erm the use of erm the have lost their their erm their whole sphere of what can go into an LRF and you see less and less voluntary sector involvement"*
F2	UK	*"So you have to learn how to work with that and to try and **ruffle feathers** occasionally. **Smooth ruffled feathers over**"*
A3	UK	*"Feeding the **beast** at the top sometimes takes priority to actually responding on the ground"*

4.4.2.2 Construction

Construction metaphors ranked 3rd in the UK findings and is a general category metaphor. Similar to Natural World and indeed all of the general category metaphors, its meaning and

broader understanding are more of a general linguistic trait then a specific emergency management concept.

Fig 4.17 below provides a range of samples to illustrate how the UK participants used the metaphor

Fig 4-17: Construction Quotes		
Participant	**Country**	**Quote**
CG1	UK	*"Under the previous administration there was I think… how did they describe it a **long screwdriver** where I can't say exactly which incidents where COBR would sit… be trying to give direction to the local gold commander when it wasn't a national it wasn't a significant"*
P1	UK	*"The interoperability aspect we're talking about common sets of **building blocks** that can be used together"*
P3	UK	*"**Cement** the learning by involvement in further exercises"*
F2	UK	*"So to **drill it down** another level"*

4.4.2.3 Acting On is Feeding

The Acting is feeding metaphor, such as *"I couldn't stomach that kind of treatment any longer",* is drawn from Lakoff, Espenson and Schwartz's (1991) (p 44) Master Metaphor List, and ranked joint 4th in the UK findings. The base premise of this metaphor is that feeding offers a process of transitivity; Fig 4.18 below provides a range of quotes illustrating usage:

Fig 4-18: Acting is Feeding On Quotes		
Participant	**Country**	**Quote**
CG2	UK	*"At local you have got the Strategic Coordinating Group that's set up by erm that's headed up by usually the Assistant Chief or Chief that's really crucial that's what I **feed** into national as a Resilience Advisor"*
LG3	UK	*"Most of the time you end up **feeding** the beast literally getting the SITREP together rather than actually doing what you need to be doing a lot of the time so it's kind of juggling your priorities"*
F2	UK	*"Spending more time actually **feeding** the beast upwards and just **feeding** information"*
A1	UK	*"Which is ignore what's going on on the ground and make sure the information is going back you know **feed** the bigger picture"*

4.4.2.4 Navigation

Navigation ranked joint 5th. Similar to other general category metaphors it is grounded within issues found in day-to-day life, and was used as the basis for communicating shared meaning. Fig 4.19 below provides examples:

Fig 4-19: Navigation Quotes		
Participant	**Country**	**Quote**
CG1	UK	*"My boss spent 15 minutes waiting to come back to me gave me the **green light**"*
CG1	UK	*"I'm deliberately keeping it very very broad not trying to **read by road**"*
LG1	UK	*"Emergency planners have this a bit of a habit at looking for ways to **circumnavigate** structures and systems to try and get information"*
F1	UK	*"You know there's some research out there that says an incident commander's span of control in a highly mobile incident is probably in the 3 to 5 region so it's **on the right track**"*

4.4.2.5 The Mind is a Container for Objects

Lakoff, Espenson and Schwartz's (1991) (p 94) the Mind is a Container for Objects metaphor; *"I can't get this idea out of my mind",* ranked joint 6th in the UK findings. Fig 4.20 below provides a sample to illustrate participant usage of the metaphor:

Fig 4-20: The Mind is a Container for Objects Quotes		
Participant	**Country**	**Quote**
CG1	UK	*"It's amazing the amount of experience there is **out** there"*
P2	UK	*"It's all coming straight **in** to you (communications)"*
P3	UK	*"There are only so many things that you can **fit into 1 human head** (complexity of response operations)"*
F1	UK	*"The same information that was getting **pushed out** to various different sources"*

4.4.2.6 Clothes and Shopping

The 7th and final UK individual metaphor was Clothing and Shopping, which was drawn from the general category: examples are listed in Fig 4.21 below:

Fig 4-21: Clothing and Shopping Quotes		
Participant	**Country**	**Quote**

CG1	UK	*"It works very effectively where you have a very strong gold commander and that might be a gold commander who's got a police **hat** on or occasionally where you've had a health **hat** or also erm a fire lead"*
CG2	UK	*"Certainly if **1 size doesn't fit all, they know what the other sizes are**"*
F2	UK	*"More **in the shop window** at silver"*
A3	UK	*"I'm now wearing a different **hat** (prior experience in a different uniform)"*

4.4.3 Individual Linguistic Metaphors – United States of America

The section below details the 2 individual linguistic metaphors noted in the US findings.

4.4.3.1 Obstacles to Action are Obstacles to Motion

The Obstacles to Action are Obstacles to Motion metaphor, i.e. *"we are fighting an uphill battle"* is noted in Lakoff, Espenson and Schwartz's (1991) (p 31) Master Metaphor List and ranked joint 3rd in the US findings. Fig 4.22 outlines examples of how US participants used this metaphor:

Fig 4-22: Obstacles to Action are Obstacles to Motion Quotes		
Participant	**Country**	**Quote**
S1	US	*"When our fire departments go to a structure fire for example they know they've got to make sure that first people are out of the building and secondly they are gonna **hit** it with everything you know"*
S2	US	*"Going in to the long term recovery it erm taxes those who are able **rise** to the occasion"*
E2	US	*"We had a centralised reporting system which allowed us to **push** the communication out to services"*
E3	US	*"It's difficult to integrate the only way **around** it is usually to use a nautical term to jury-rig the system by the commander erm rather than the system itself"*

4.4.3.2 Ideas are Constructed from Objects

The Ideas are Constructed Objects metaphor, i.e. remembering is reconstructing, and was drawn from Lakoff, Espenson and Schwartz's (1991) (p 97) Master Metaphor List ranked 4th in the US findings. Fig 4.23 below provides a sample of relevant quotes:

Fig 4-23: Ideas are Constructed Objects Quotes		
Participant	**Country**	**Quote**
FE3	US	*"I can **break it down** to what I think is the most fundamental Tony the ability erm to provide leadership during the mission"*
S2	US	*"Budgets and allocation rules and statutes all of those things can be thrown **out of the window** at the time of an emergency"*
E3	US	*"So let's call a unified command and so… just **building**… based on based on resources based on the need of what is actually needed for that event "*
LE2	US	*"The rescue's done now it's recovery so these are the **layers** of recovery"*

4.4.4 Morgan's Metaphors

This section presents the detailed findings for Morgan's metaphors building on the synopses provided in Figs 4.9 and 4.10. 6 of Morgan's 8 metaphors were noted in the transcripts.

4.4.4.1 Culture

In terms of triangulated usage of Morgan's metaphors, the sample frame used Culture most frequently, as it was located in 21 of 30 transcripts. This is an interesting finding because Schein (2010) (p18) defines culture as *"a pattern of shared basic assumptions learned by a group as it solves its problems of external adaptation and internal integration".* So, linguistically Command and Control is believed to be a pattern of shared basic assumptions, which contradicts the empirical findings. This indicates a divergence between the 2 sets of findings. Fig 4.24below provides a sample of how participants used the Culture metaphor:

Fig 4-24: Culture Quotes		
Participant	**Country**	**Quote**
LG2	UK	*"The way (blue-light) staff are **brought up** in those environments"*
P3	UK	*"It's part of our **culture**"*
F1	UK	*"Rather than a standard definition erm **it's a way of life** for us erm it's trained in for every fire fighter you know the minute the start training"*
S3	US	*"It starts with the training and the education erm there's a **cultural** piece that I suspect that is important erm not everybody is attuned or works well in you know in a Command and Control situation some people aren't willing to subordinate"*
LE2	US	*"It's **automatic** for us"*

E3	US	*"The (Forestry Service) Fire fighter is like the man at this stuff he is an example of… he knows it he **preaches** it he does it and they have to because they've got so many people on the ground that erm you screw up and fire fighters are dead so they have to be the experts in that's where it came from"*

4.4.4.2 Organism

Organism ranked 2nd in both the UK and US findings and its usage reflects the flexibility theme noted in the content analysis. Fig 4.25 below continues samples of usage of the Organism metaphor:

Fig 4-25: Organism Quotes		
Participant	**Country**	**Quote**
CG3	UK	*"They relatively quickly adapted to I wouldn't even say they did it deliberately it **evolved** in that the structure become less formalised about gold level about silver level and more about sharing information coordination and ensuing each agency has the information the right information and the right understanding of that information"*
F3	UK	*"The incident command system itself is being developed all the time so it's **evolving**"*
A1	UK	*"Implementation of actions it's a **living cell** as as far as I'm concerned"*
FE1	US	*"I think we were learning and it's **evolving** we're getting better at it"*
S2	US	*"That it's got to be flexible it's got to be scalable and we could go into a dozen different descriptors erm so that it's not an inflexible organisation that can **morph** with the situation and if it can't **morph** with changing conditions then it's gonna break"*
FR3	US	*"A state like Maine we have no choice we have no choice but to **adapt** and adopt it because with the limited number of resources that we have in this state if something significant like Hurricane Sandy happens here it's it's inevitable we're gonna ask for outside help"*

4.4.4.3 Machine

Given the hierarchical and top-down findings, there was a high likelihood that the Machine metaphor would be found in the natural language of the participants. Indeed, it ranked 3rd in

both the UK and US, which differs slightly from the empirical rankings data as this metaphor ranked 3rd in the UK and 2nd in the US. Fig 4.26 below provides examples of use:

Fig 4-26: Machine Quotes		
Participant	**Country**	**Quote**
CG2	UK	*"There needs to be understanding of when certain **parts** of Command and Control are used and utilised so when you when you **operate** them when you **bang them** in you em **start them up***"*
LG3	UK	*"I would guess erm to a large extent erm situations where erm **we can break down sort of component parts** in to some things that have to be you know a certain level of competence"*
P2	UK	*"There is more of a willingness to **push the button** now (activate emergency plans)"*
FE3	US	*"To erm distribute the messages and the direction erm that are part of the erm the leaders intent and also the **by-products** of the planning erm planning functions and other functions that are critical to Command and Control"*
S1	US	*"The various **components** all the way up through the federal level"*
FR3	US	*"We saw as soon as we walked in the room these people aren't **operating as we say on all 8 cylinders I mean they we were spluttering**"*

4.4.4.4 Political System

Somewhat surprisingly the Political System metaphor only triangulated within the US findings where in ranked 2nd. This may be explained by the US governmental system that can be described as hyper-political in comparison to the UK, which is relatively simplistic (Sylves 2008). Fig 4.27 below outlines relevant example:

Fig 4-27: Political System Quotes		
Participant	**Country**	**Quote**
FE2	US	*"There are a lot of individual personalities in each one of the states that we do that… we serve in New England each one of the State Directors each one of the people that work for the State Directors and you have to be respectful for the fact that you are in their state and there's some times erm… sometimes people have a tendency to come in with a save the world attitude and fail to recognise… they need to understand that*

		they are working within someone else's jurisdiction it's it's not their place it's somebody else' place and we're in support of whatever they're doing"
LE3	US	*"You had a mayor trying to dictate emergency management that doesn't work we're the professionals we do it for a living we plan for this we exercise for this let us do our job the Mayor of XX XXXX did not do that"*
FR3	US	*"I ultimately I work for the Governor of the State of Maine and erm you know I might have a large wildfire 10,000 acre wildfire that I'm managing but the governor is the chief executive officer for the state of Maine he would be considered an agency administrator and he while he would not have influence directly on how I do things tactically or strategically he may influence on how I set objectives based on the fact that there are certainly always political considerations when it comes to managing any type of incident and the fact ultimately he's our boss"*

4.4.4.5 Flux and Transformation

Morgan's (2007) Flux and Transformation metaphor ranked 4th in the UK findings, which was surprising given the basis of the metaphor is that structures develop from chaos and complexity. These traits would seem to be a natural link to the participant's strong-held views that Command and Control brings order to the chaos but this wasn't the case (Oates and Fitzgerald 2007). Fig 4.28 below illustrates usage of this metaphor:

Fig 4-28: Flux and Transformation Quotes		
Participant	**Country**	**Quote**
CG2	UK	***"****There are people you know aren't new in it there are people that've been doing resilience for many years and they say that's fine we've always done it and that's you know do you not understand that actually things are* ***changing****"*
F3	UK	***"****They're developing all the time, there's so many* ***new*** *initiatives and* ***new*** *ideas coming to the fore"*
A2	UK	*"Yea a mean Command and Control it's* ***completely changing****"*

4.4.4.6 Summary of Linguistic Findings

The linguistic data captured accessed the natural spoken language of the sampled practitioners, and achieved Objective 3, which sought to *"produce linguistic and visual data that encapsulates emergency management practitioner's views on Command and Control".*

Section A of Figs 4.9 and 4.10 provided an overview of metaphorical phrases that can be used to promote general linguistic understanding across organisations. The most common metaphor, within both data sets, was Status is Position, for example *"it will always defer **down** to the next senior person"* which, reflects the top-down perspective often associated with Command and Control. All of the listed metaphors are understood by at least 3 organisations thus, they offer the beginnings of metaphor-based communication enhancement system or language. This is because the conversational usage of the induced metaphors can assist the transferal and reception of jointly understood meaning in a multi-agency setting. The cognitive meanings afforded by the linguistic metaphors actually go beyond Command and Control broadening into general language, the higher the count the greater the likelihood of mutual understanding amongst conversationalists, illustrating potential wider application of metaphor based approaches.

Section B illustrates the usage of Morgan's (2007) metaphors within the interview transcripts. Though the tables illustrates all expressions, those considered significant are those triangulated across 3 organisations. Notably, Morgan's metaphors were found in the natural spoken language of all but one participant, A3, indicating that this theory is linguistically relevant to emergency management.

Culture was the most frequently used of Morgan's metaphors across both UK and US data sets, followed by Organism, though Political System also ranked 2nd in the US, Machine ranked 3rd, with Flux and Transformation and Instrument of Domination ranking 4th in the UK and US respectively. Section C presented 7 induced metaphors of Command and Control, which informed the development of a suite of learning tools discussed in chapter 6. These include Precious Metals, Spinning Plates, Herding Cats, Golden Thread, Banging Your Head Against of the Wall, Candle and Virus/Antidote, which provide a solid basis for theory development.

The following section provides an overview of the visual metaphors of Command and Control drawn by each participant. There are 30 in total and they are formed into organisational groupings of 3 for ease of reading. The individual metaphors are displayed in landscape orientation, and each grouping is followed by collective discussion of the respective visual metaphors within the said grouping.

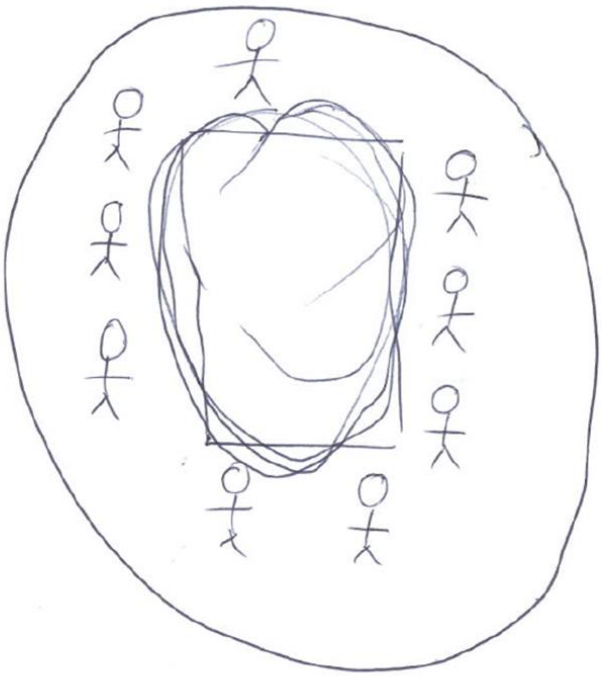
4.5 Visual Data – Interpreting Visual Metaphors of Command and Control

Visual research is becoming more influential in the social sciences, meaning researchers are increasingly engaging with the visual domain (Pink 2012). The research design was inspired by Schachtner's (2002) work on how medical doctors come to diagnostic and therapeutic decisions in cases of vague illness and long and complex searches for diagnosis. During interview, each participant was given a blank template (see Appendix 3) and a pen, then invited to draw a visual representation of Command and Control. No other guidance was provided or restriction implied. The participant was granted *"free reign"* and as much time as necessary to complete the task. The author did not specify *"draw a metaphor or diagram*", thus a broad interpretation of *"visual metaphor"* was adopted within this study. Interestingly, the task was completed within a matter of minutes on each occasion.

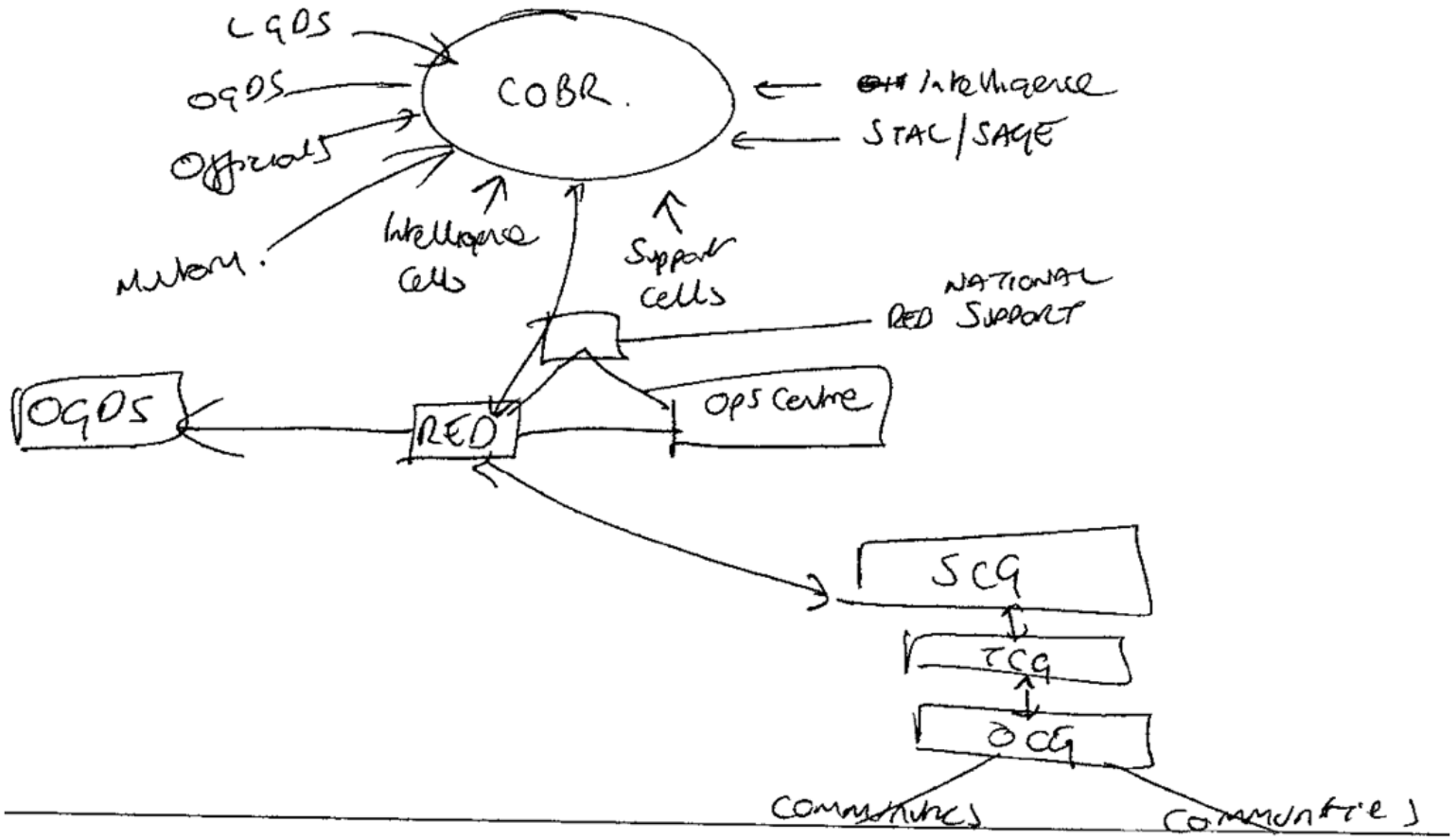
4.5.1 Visual Metaphors – United Kingdom

4.5.1.1 Central Government

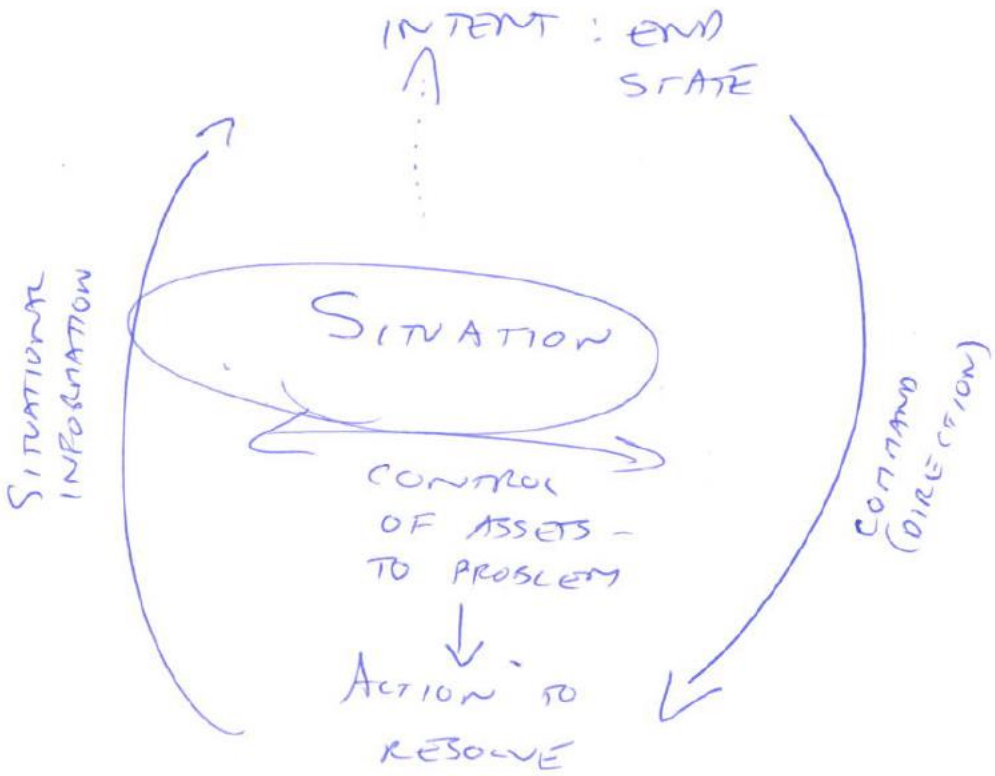
- **Participant Code: CG1**



- **Participant Code: CG2**



- **Participant Code: CG3**



4.5.1.2 Overview of Central Government Visual Findings

UK Central Government plays an important role in emergency management, providing support and guidance to local emergency responders (Dillon 2014, Kapucu 2010). Sitting at the apex of the emergency management hierarchy (see Organigram 1) an expectation of a standardised view of Command and Control would be reasonable. However, participants CG1, CG2 and CG3 showed very different interpretations of Command and Control. CG1 viewed Command and Control as a system, CG2 adopted a more traditional organigram approach, and CG3 adopted a process view.

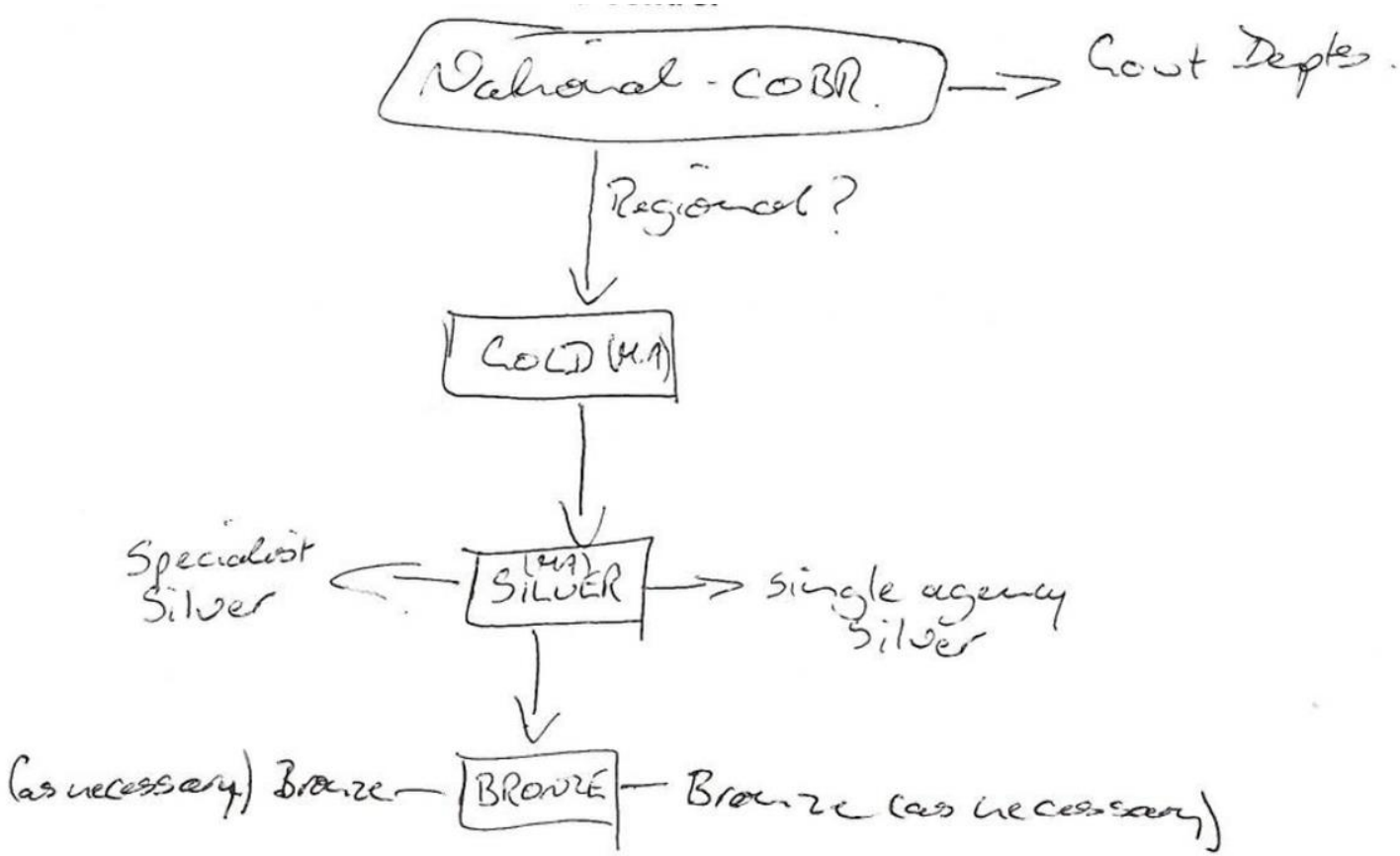
CG1's system perspective was built around the idea of Command and Control as a heart at the centre of a group of people brought together in a circle, which represented the system.

CG2 displayed a relatively holistic organigram perspective where the GSB framework is linked to the community and forms the base of the diagram (H.M. Government 2004c). The local level is linked upwardly to the Cabinet Office Briefing Room (COBR) via the Resilience and Emergencies Division (RED), and both RED and COBR are linked into support from the wider resilience community (H.M. Government 2012a, H.M. Government 2013a).

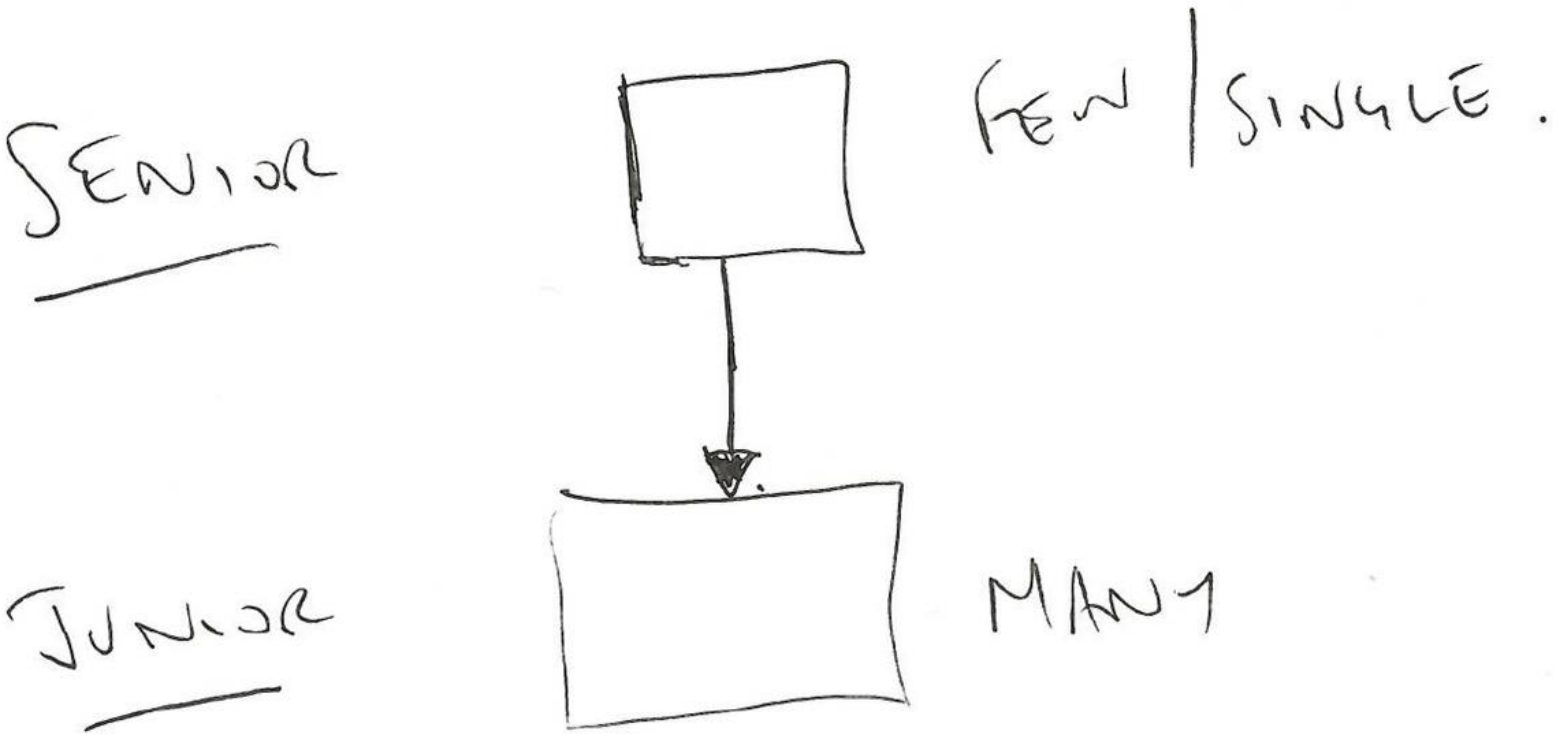
CG3 embraced a process view where Command and Control was centred on a situation, which was underpinned by an assessment of the problem and actions to resolve the said problem. A cyclical process of situational information and command direction that combines with intent to research and an end state then surrounds this process, which is the resolution of the *"emergency*".

4.5.1.3 Local Government

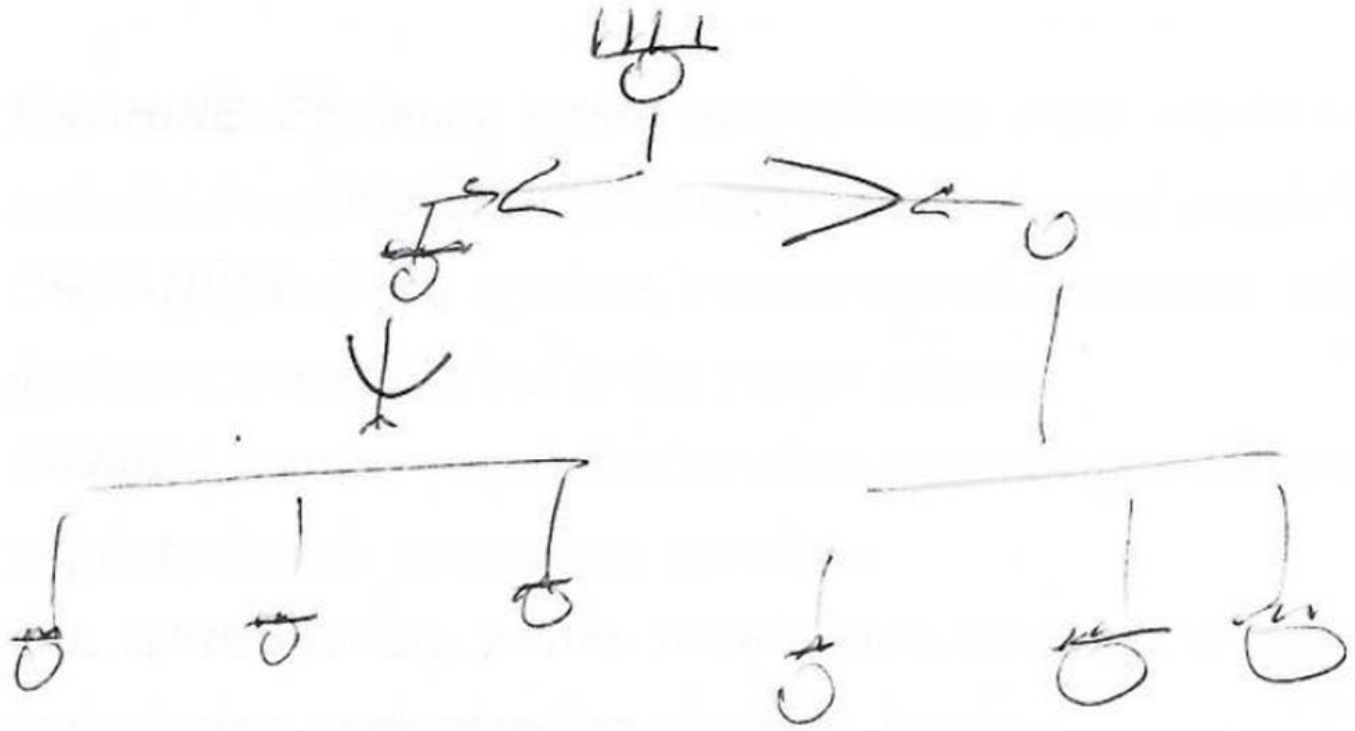
- **Participant Code: LG1**



- **Participant Code: LG2**



- **Participant Code: LG3**



4.5.1.4 Overview of Local Government Visual Findings

Local Government are an important category 1 emergency responder in UK emergency management and charged with coordinating the recovery process (H.M. Government 2012a, H.M. Government 2013e). However, Local Government officers are not primarily emergency responders as their day-to-roles can include refuse collection, issuing of benefits, housing or road maintenance rather than *"emergency"* response (H.M. Government 2014d). All 3 visual metaphors adopted a hierarchical organigram approach, with senior command appearing at the top of the diagrams.

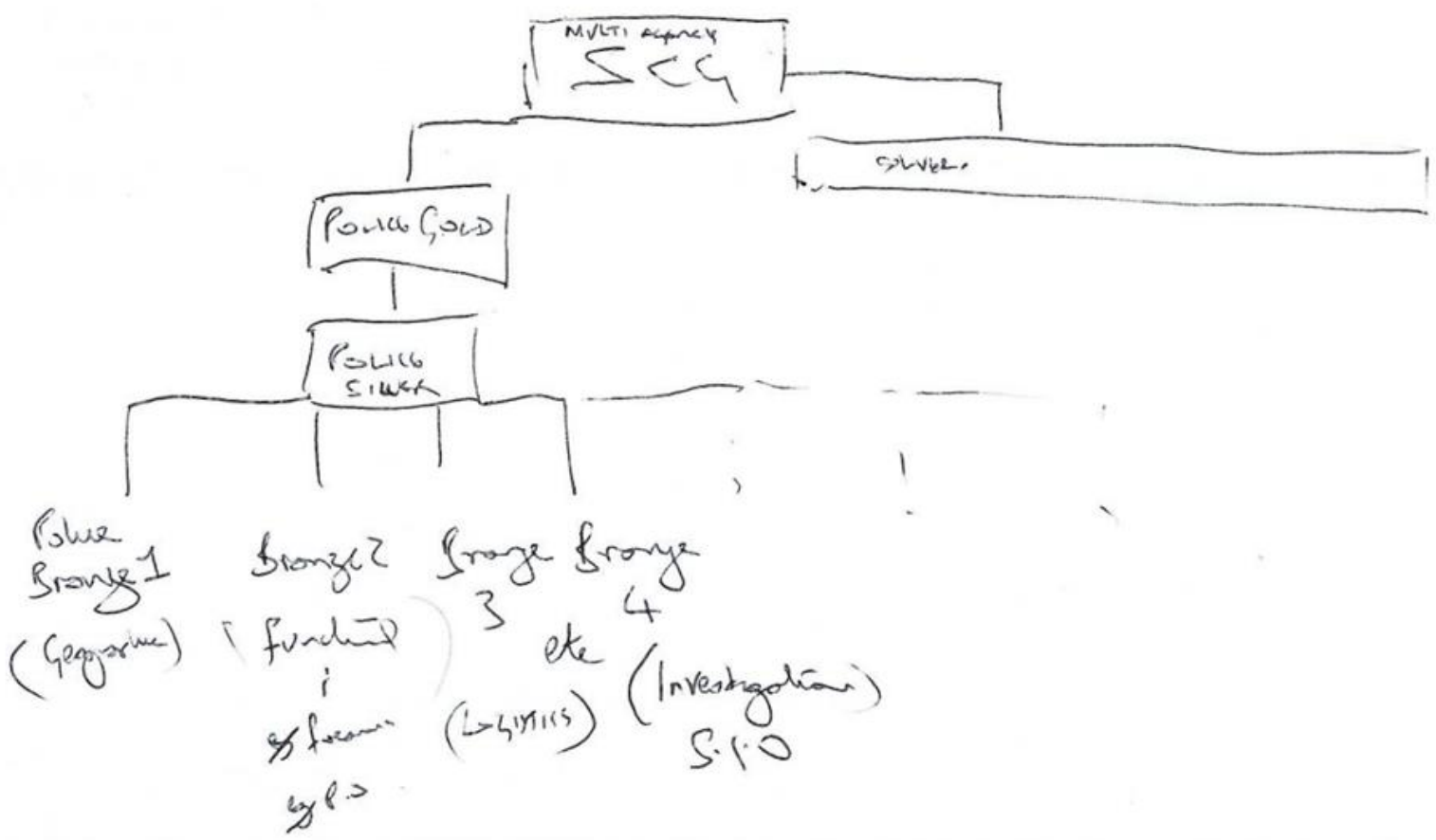
LG1 applied a combination of the UK GSB and COBR framework, annotating internal and multi-agency Tactical (Silver) cells within GSB and highlighting the scalability of the Bronze level with horizontal lateral arrows (H.M. Government 2004c, H.M. Government 2013a).

LG2 adopted a more simplistic interpretation though still within a hierarchical organigram context. The diagram contained 2 nodes: senior command, with few or a single representative at the top and junior command with many representatives at the bottom.

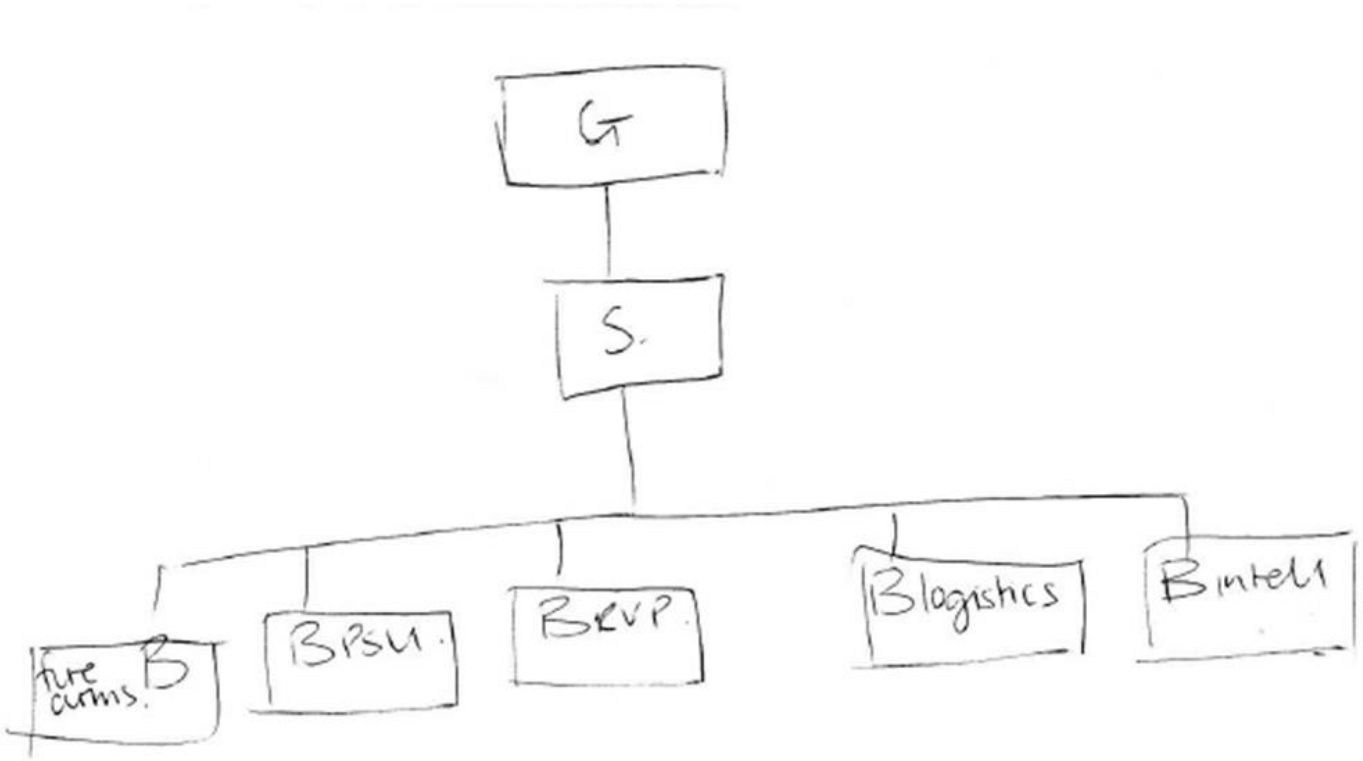
LG3 also used an organigram with a single commander appearing at the top annotated with a crown to signify authority, with subordinate commanders below who are in charge of larger groups of subordinates. Arrows were used to indicate the flow of authority down from the Incident Commander, and arrows on top of the subordinates signify an upward flow of information to commanders.

4.5.1.5 Police Service

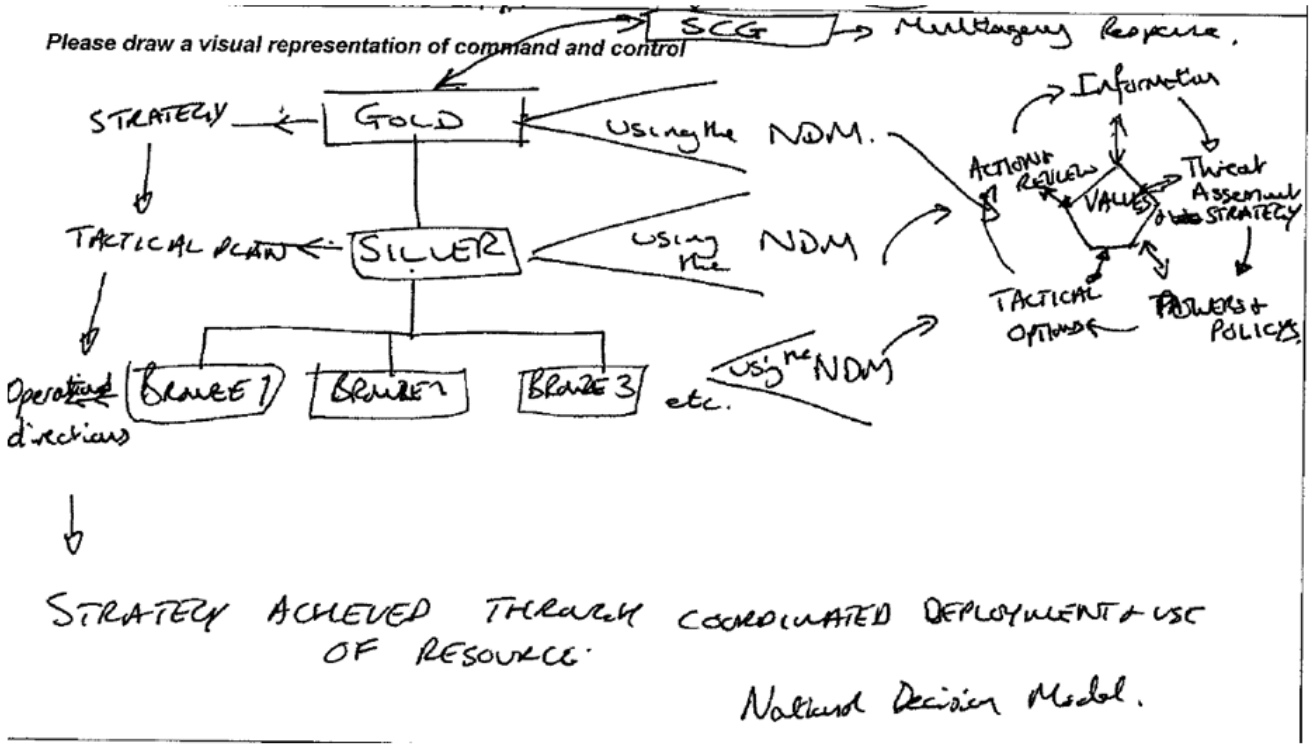
- **Participant Code: P1**



- **Participant Code: P2**



- **Participant Code: P3**



4.5.1.6 Overview of Police Service Visual Findings

The Police service is a key part of UK emergency management; their strategic coordination or Gold Commander role is pivotal to response coordination (College of Policing 2015a, H.M. Government 2004c). Command and Control is part of day-to-day policing operations as well as multi-agency *"emergency"* response (National Police Improvement Agency 2009a). P1, P2 and P3 all framed Command and Control as an organigram focusing on the local level only with the multi-agency Strategic Coordination Group (SCG) or Gold Command being seen as the highest level in the hierarchy.

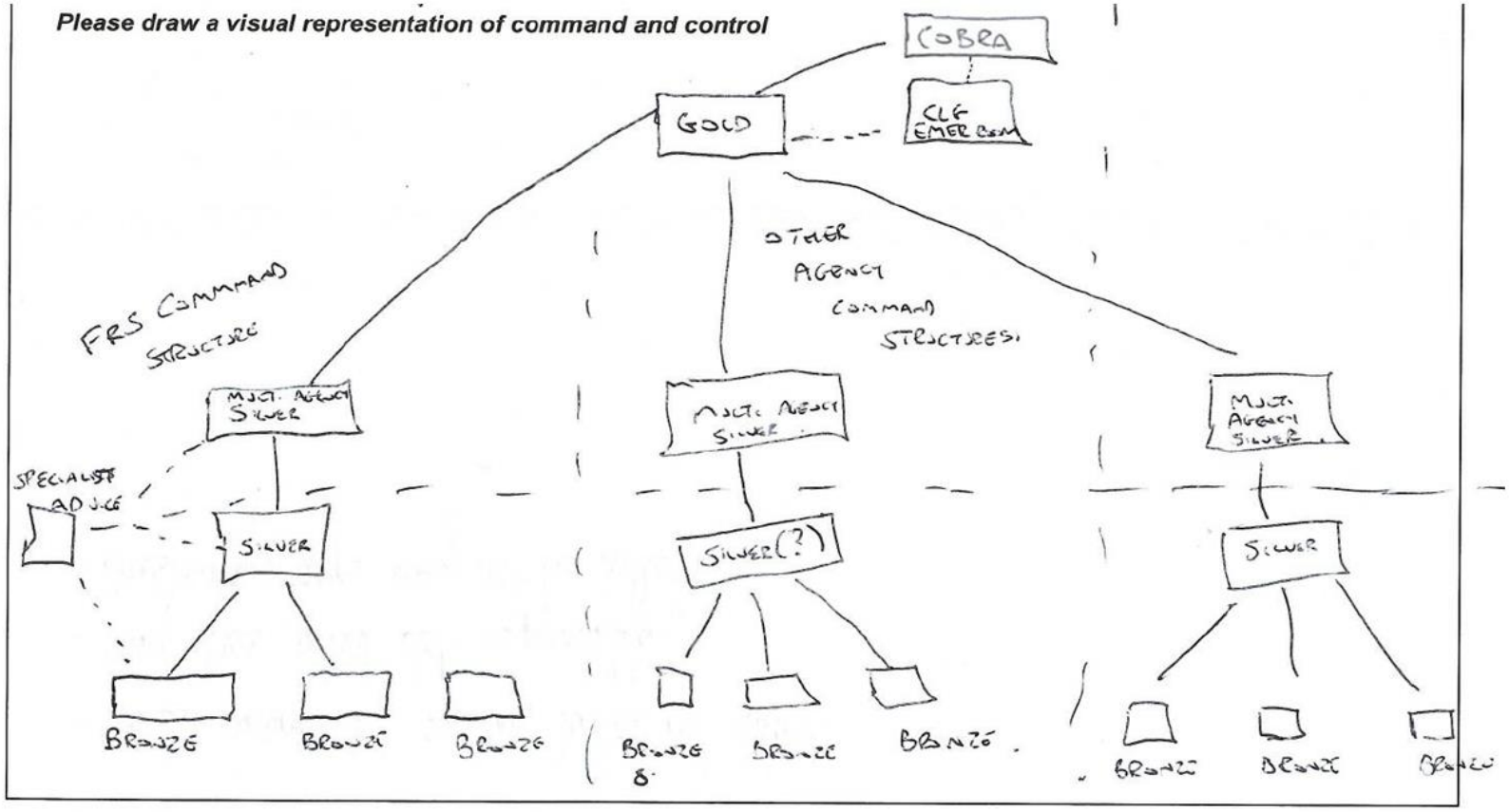
P1 marked the SCG and multi-agency Tactical (Silver) command at the top of the diagram, but the crux of the diagram was the internal Police Command and Control framework for day-to-day operations. GSB methodology was applied internally with derivatives at the Bronze (Operational) level for geographic, functional, logistics and investigative command nodes.

P2 used a more simplistic internal application of GSB focused on Police operations with firearms, Police Support Unit (PSU), Rendezvous Point (RVP), logistics and intelligence Operational (Bronze) command derivatives.

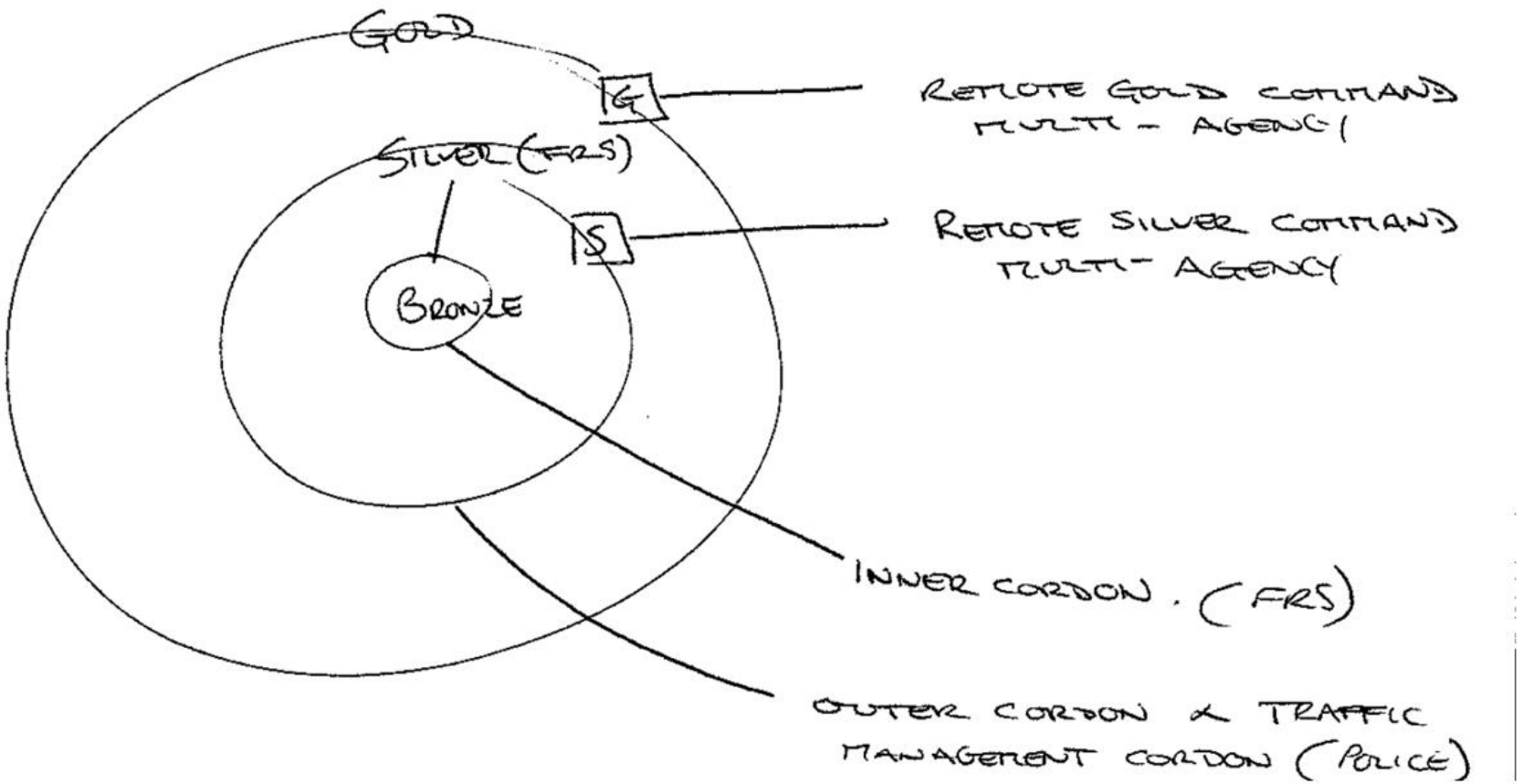
P3 drew a more detailed image, though still localised in its focus, it merged the Police National Decision Model (NDM) into a multi-agency interpretation of GSB linking strategy to Gold, tactical planning to Silver and Operational direction bronze command nodes (College of Policing 2015b).

4.5.1.7 UK Fire and Rescue Service

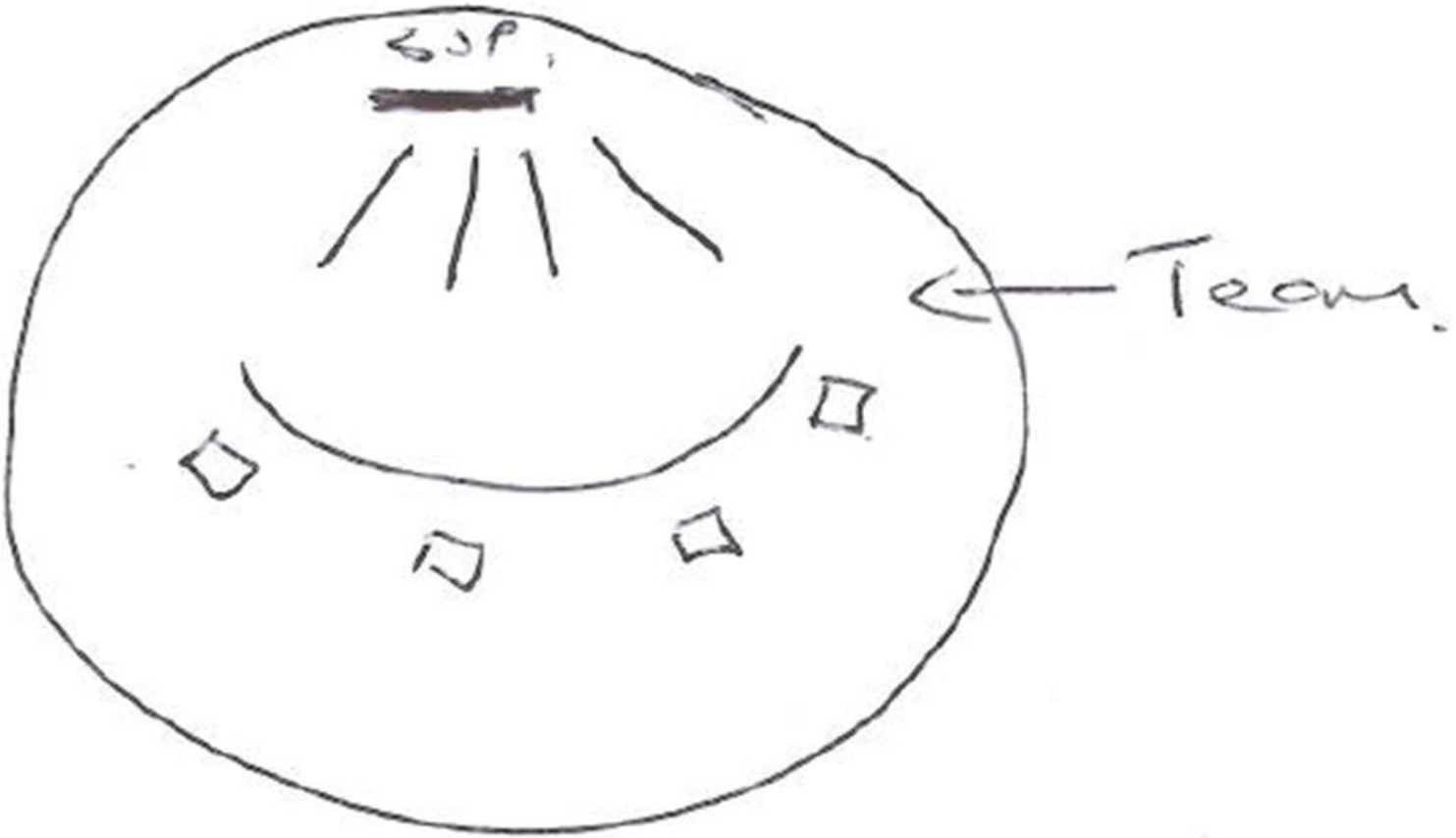
- **Participant Code: F1**



- **Participant Code: F2**



- **Participant Code: F3**



4.5.1.8 Overview of UK Fire and Rescue Service Visual Findings

The UK Fire and Rescue service (FRS) have responsibility within the inner cordon at the Bronze level of most *"emergencies"* (College of Policing 2014). Command and Control is an integral part of day-to-day of FRS activities; generally they are hierarchical paramilitary organisations. F1 adopted an organigram approach, whereas F2 framed Command and Control in a physical context with the GSB framework used to encircle a notional *"emergency"* in the centre of the diagram (though this is not actually marked). F3 utilised a more abstract smiley face concept, though the face was used to represent a physical floor plan of a command room. This sample-frame demonstrated considerable variance in terms of their interpretations of Command and Control.

F1 listed COBR (marked as Cobra) at the apex of the Command and Control hierarchy sitting above Gold command and the Department of Communities and Local Government's Emergency Room, denoted by CLG command node, which they connected to both COBR and Gold. Below Gold are the FRS and 3 other agency command structures, multiple multi-agency Silver commands linking in single-agency Silver commands, which are supported by specialist advisors indicated by a horizontally linked node. The Silvers are in turn linked down to multiple Bronze commands at the bottom of the organigram.

F2 applied GSB physically in a top down manner as the layers of the command hierarchy are cognitively layered over an imagined *"emergency*". The Bronze, Silver (FRS only) levels of command are marked on inner and outer cordons and responsibility is assigned to organisations: inner FRS, outer Police. Multi-agency Silver and Gold commands are marked as remote to indicate they are away from the scene.

F3 drew a smiley face, which is also a floor plan for a command room. The supervisor, denoted as Sup, is marked at the top of the diagram and the teeth represent the team members. The smile separates the supervisor from subordinates; the lines of the nose represent 2-way communication, and this process of Command and Control is contained within a happy face.

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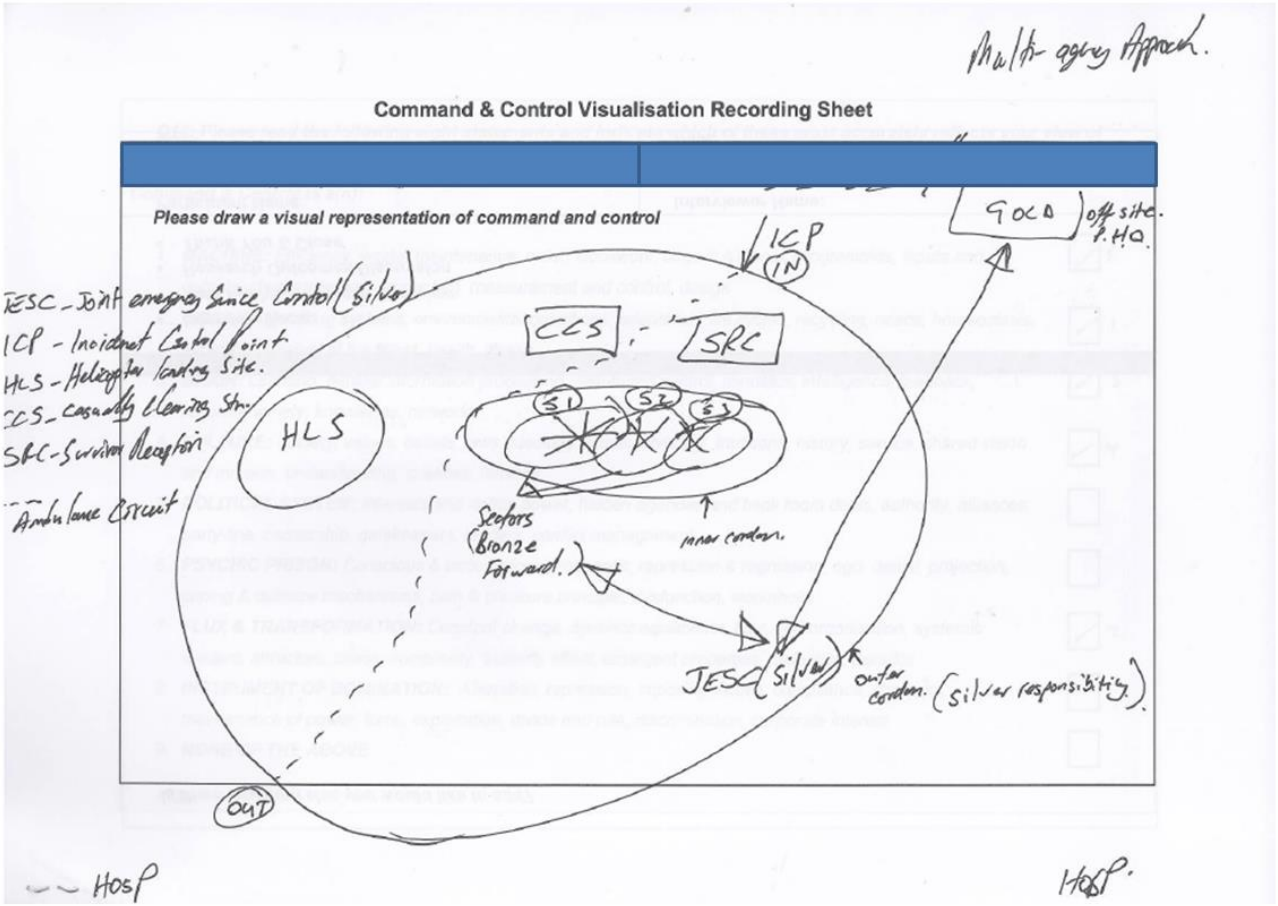
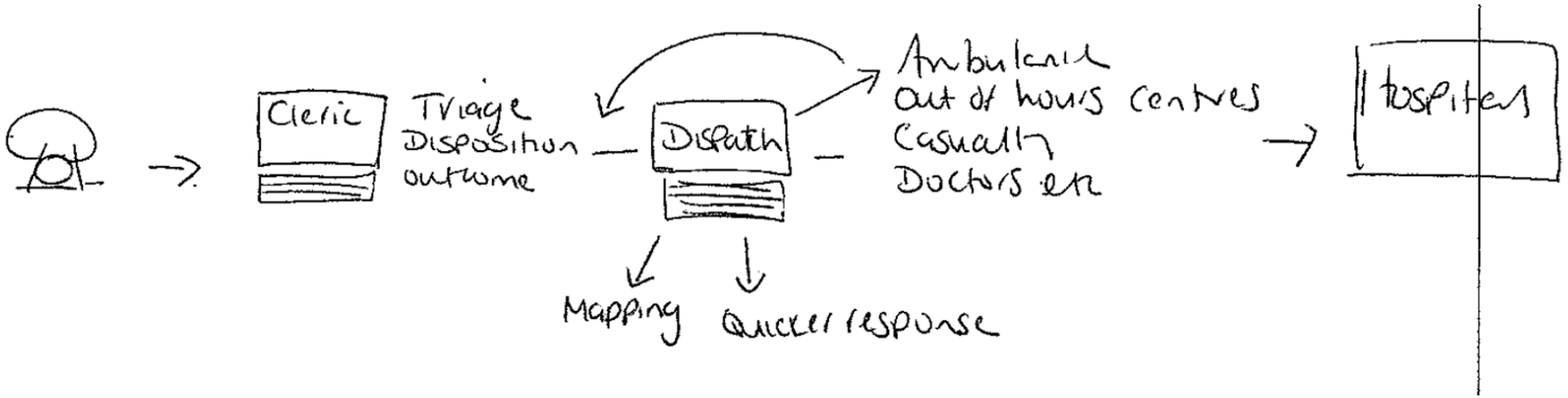
4.5.1.9 Ambulance Service

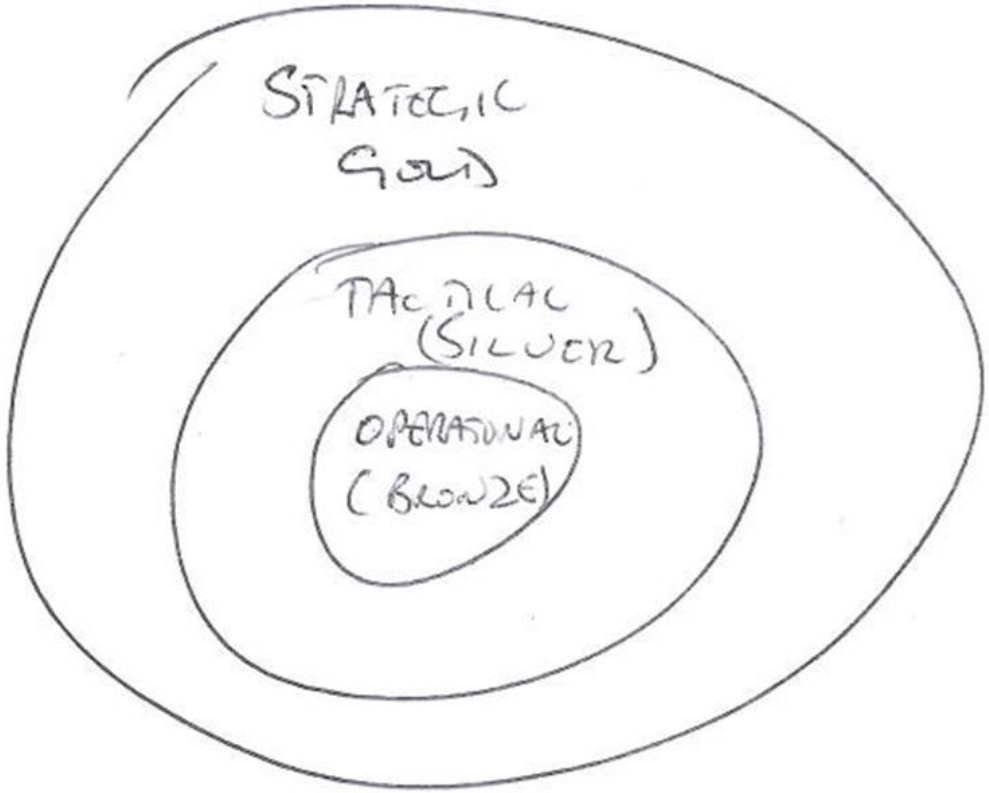
- **Participant Code: A1**



- **Participant Code: A2**



- **Participant Code: A3**



4.5.1.10 Overview of Ambulance Service Visual Findings

The Ambulance services have evolved considerably in the last decade. The introduction of the Hazardous Area Response Team (HART) programme means specially trained paramedics can now enter the inner cordon alongside the Fire service to provide clinical intervention to patients earlier to save more lives (North East Ambulance Service 2011).

A1 and A3 visualised Command and Control in a physical frame, whereas A2 adopted a process viewpoint. A1 applied the GSB framework around a notional *"emergency"* in a top-down manner. The Bronze command was located within the inner cordon, which is sectored, and the Silver command was located at the scene on the outer cordon and the Incident Command Point (ICP), which acts as the entrance (denoted by *"in"*) to the cordon is clearly marked. Within the cordon, the Casualty Clearing Station (CCS) for triage, the Survivor Reception Centre (SRC) for the non-injured and a Helicopter Landing Site for the most severely injured patients are readily identifiable along with a dotted route through from the ICP entrance to the exit (denoted by *"out"*) from the cordon, illustrating the physical nature of this interpretation. The Gold command appears at the top of the diagram and is noted as off-site at Police Headquarters (signified by P.H.Q.).

A2 framed Command and Control as a linear (signified by an arrow) ambulance dispatch process, which begins with a telephone call at the left of the diagram. This is followed by triage of the patient's disposition, which is then categorised for dispatch. This process is underpinned by mapping and quicker response resulting in either ambulance dispatch, referral to out of hour's centres, casualty, a Doctor or re-categorisation, then the patient moves on to hospital.

A3 also adopted a physical conceptualisation of Command and Control again applying the GSB framework in a top down manner surrounding a notional, though unmarked *"emergency"* with concentric circles which are labelled as the Bronze, Silver and Gold levels of command.

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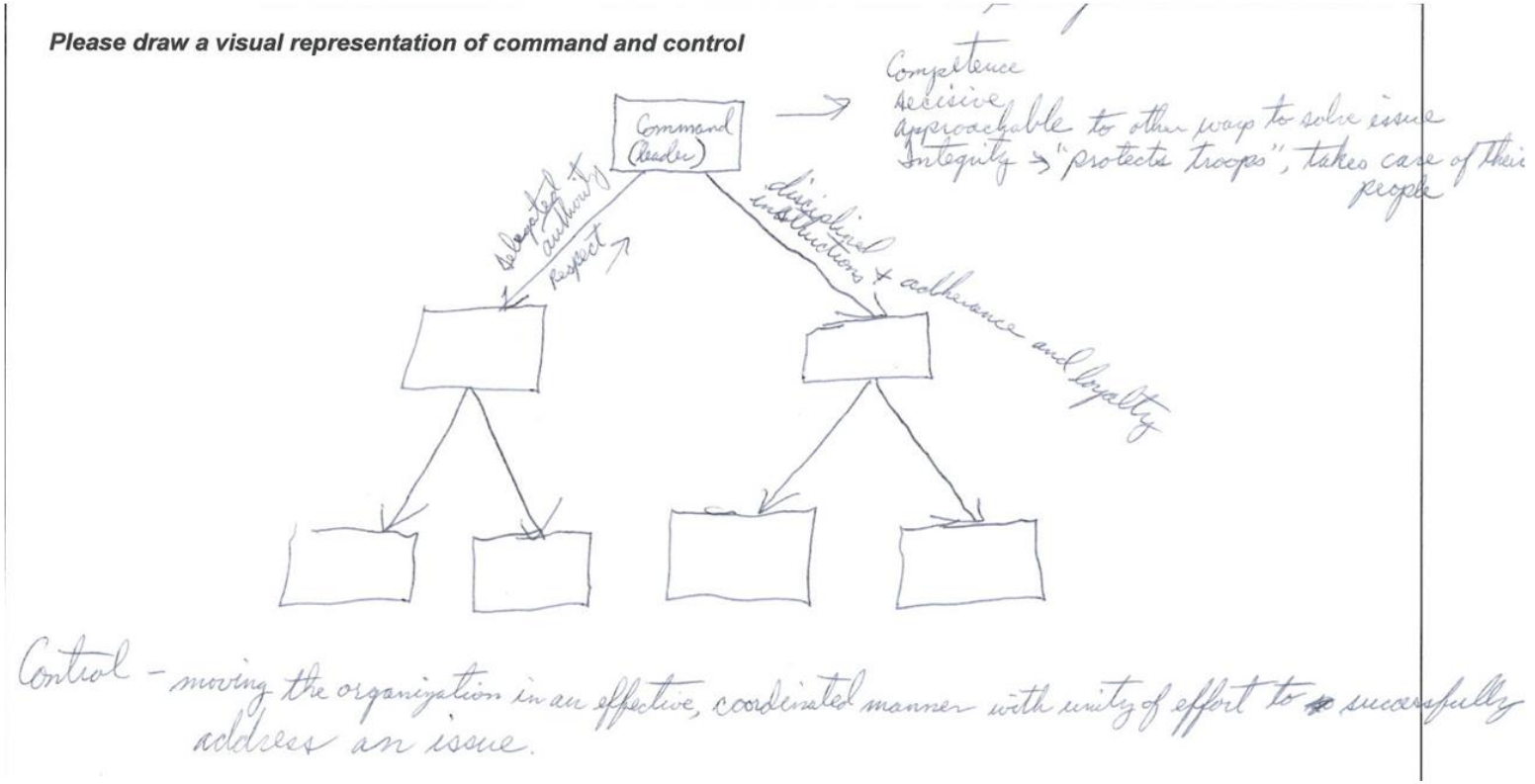
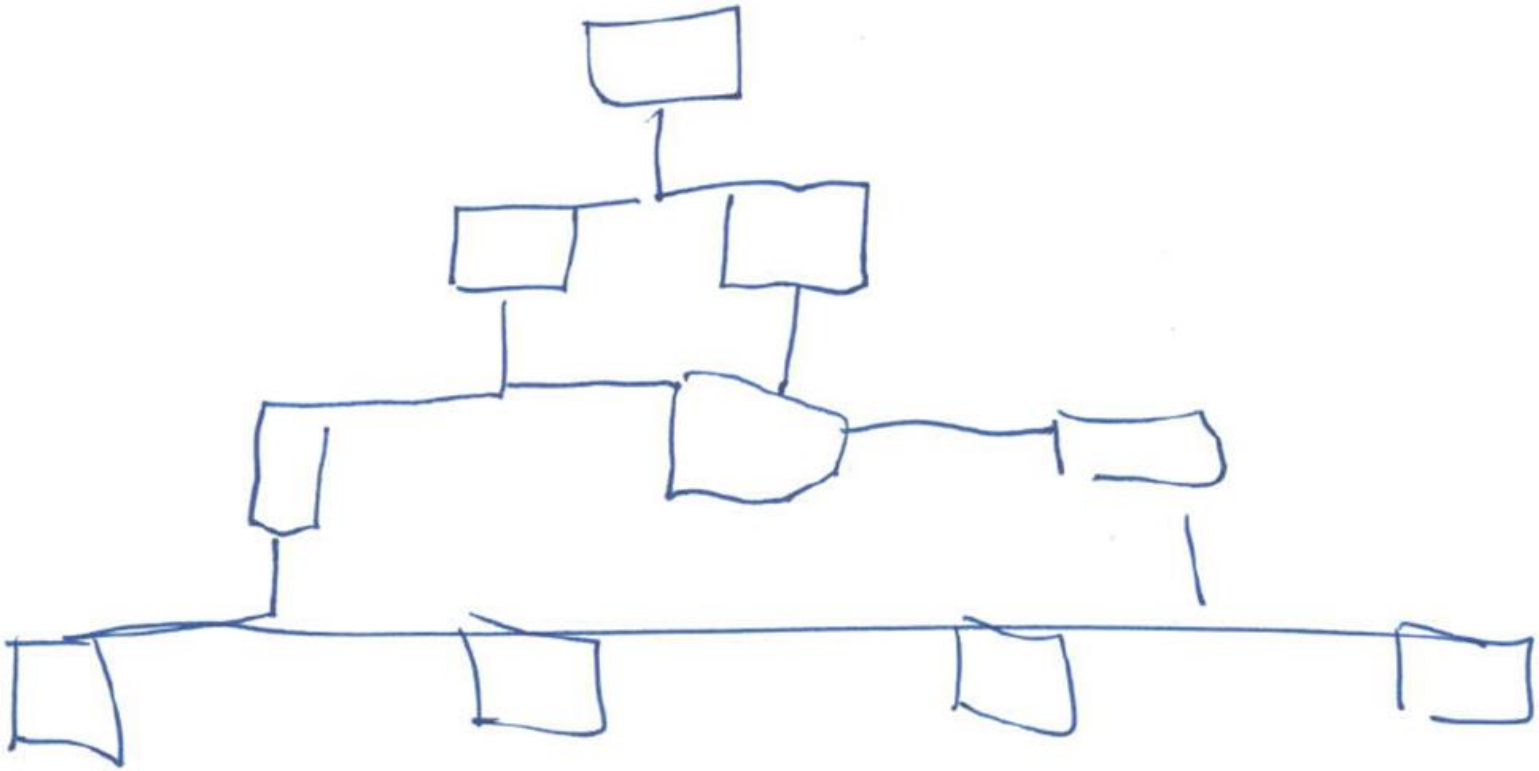
4.5.2 Visual Metaphors – United States of America

4.5.2.1 Federal Emergency Management Agency

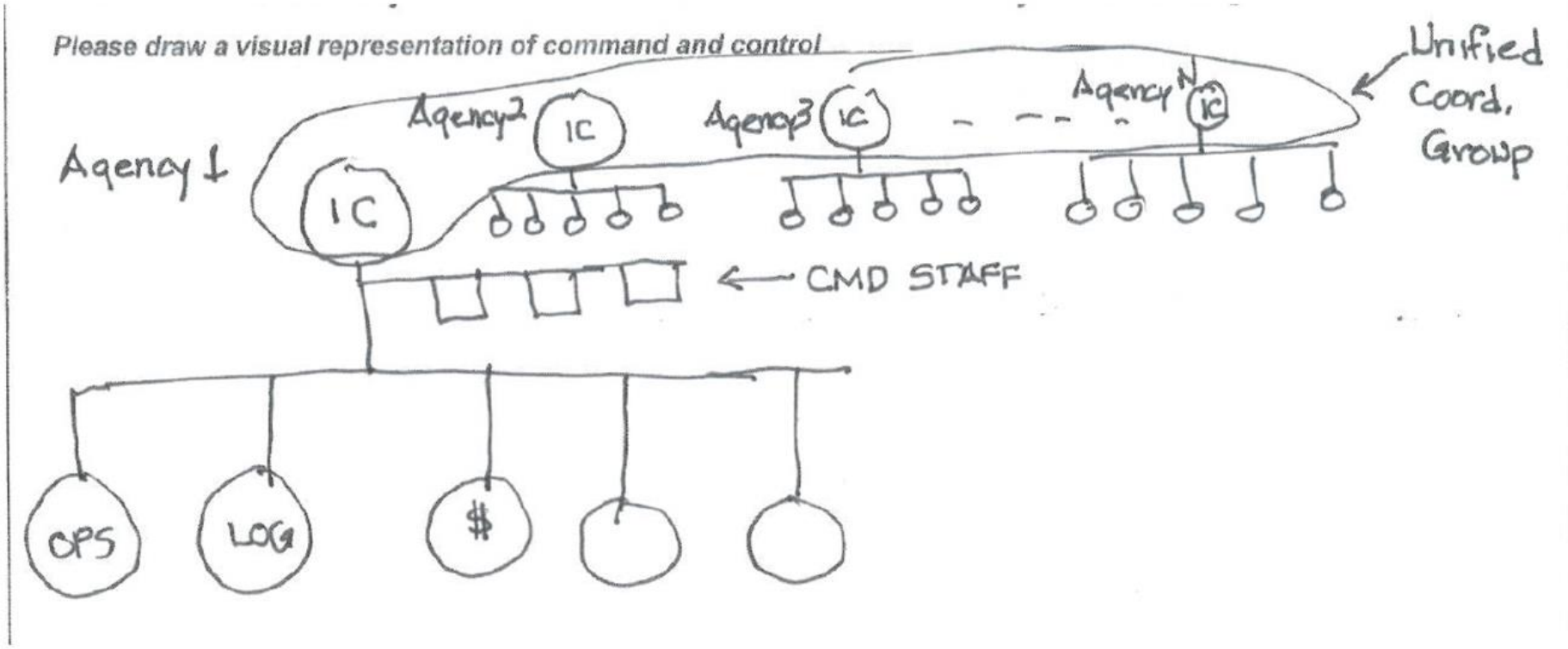
- **Participant Code: FE1**



- **Participant Code: FE2**



- **Participant Code: FE3**



4.5.2.2 Overview of Federal Emergency Management Agency Visual Findings

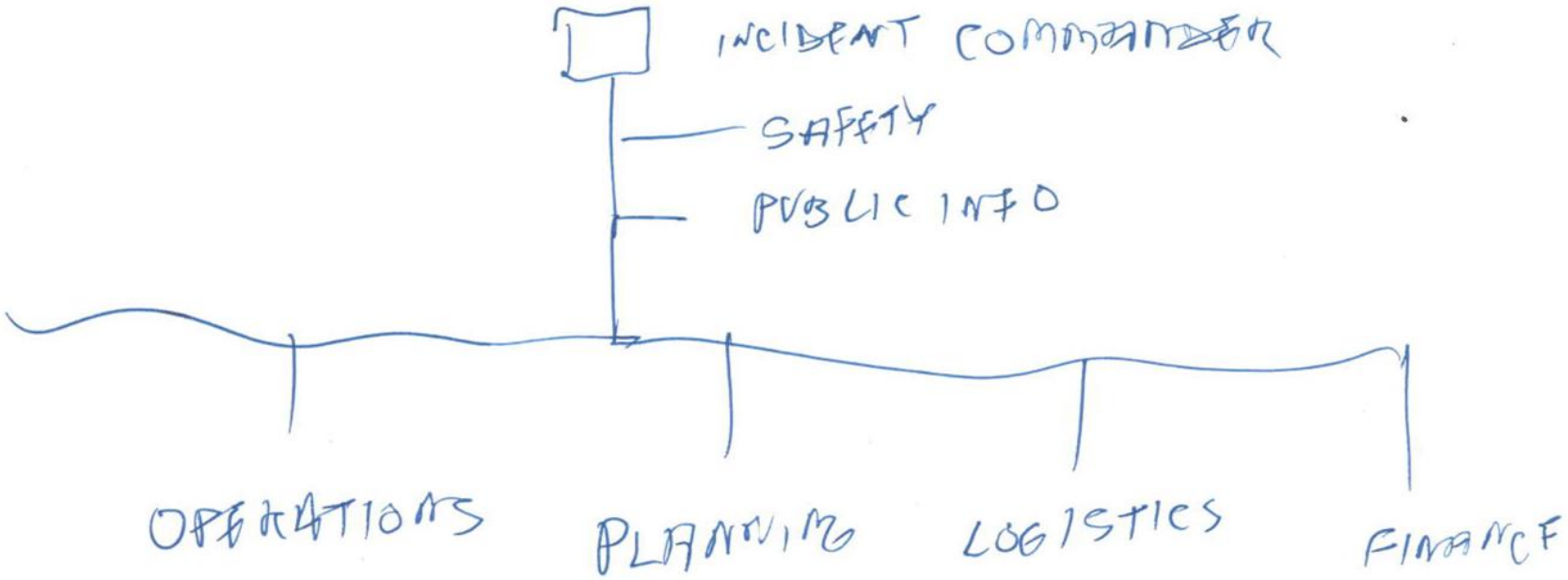
FEMA actively promotes compliance with NIMS doctrine (Federal Emergency Management Agency 2014j). The legal mandate is drawn from Homeland Security Act of 2002 and Homeland Security Presidential Directive 5 (HSPD5) (107th US Congress 2002, Jensen 2011, Jensen and Waugh 2014, U.S. Government 2003). An integral part of NIMS is the Incident Command System (ICS), which is considered by the Department of Homeland Security (DHS) as best practice for on-scene all-hazard incident management (Federal Emergency Management Agency 2004).

FE1, FE2 and FE3 all adopted an organigram approach. FE1 placed command at the top of the hierarchy (with the leader in brackets underneath) and annotated the diagram with associated human traits of competence, decisive, approachable and integrity. The lower tiers of the hierarchy are connected with downwards flowing arrows, which are also annotated with human traits of delegated authority and respect flowing upwards on the left arrow, and disciplined instructions plus adherence and loyalty flowing downwards on the right arrow. Additional layers in the hierarchy expand down and out increasing the span of control, though these are not annotated. Control is marked at the foot of the diagram with a note stating *"moving the organization in an effective, coordinated manner with unity of effort to successfully address an issue".*

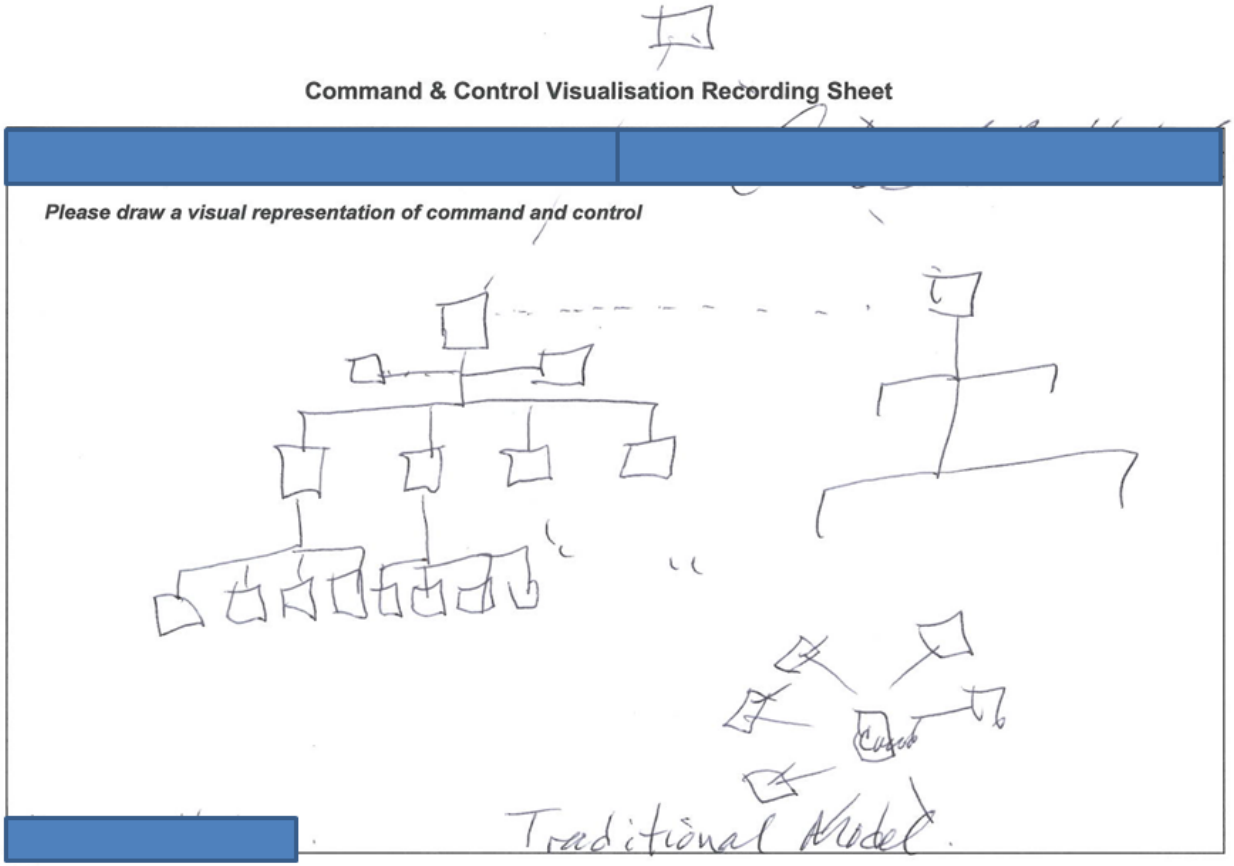
FE2 offered a simpler interpretation. Their image still used an organigram: however, the hierarchy is made up of blank nodes, which are linked to more nodes lower down the diagram, which increase in number. FE3 on the other hand provided a far more detailed organigram, which closely resembles the ICS framework. It contains multiple Incident Commanders, denoted by ICs, from different agencies marked at the top of the diagram. These are grouped together in a Unified Coordination Group (UCG) signified by a black encircling line. The IC appears at the top of the hierarchy and is supported by command staff, which collectively sits above operations, logistics and finance (denoted by a $ symbol) and 2 blank nodes. This structure is replicated though not exactly under each Agency across the diagram.

4.5.2.3 State Emergency Management Agency

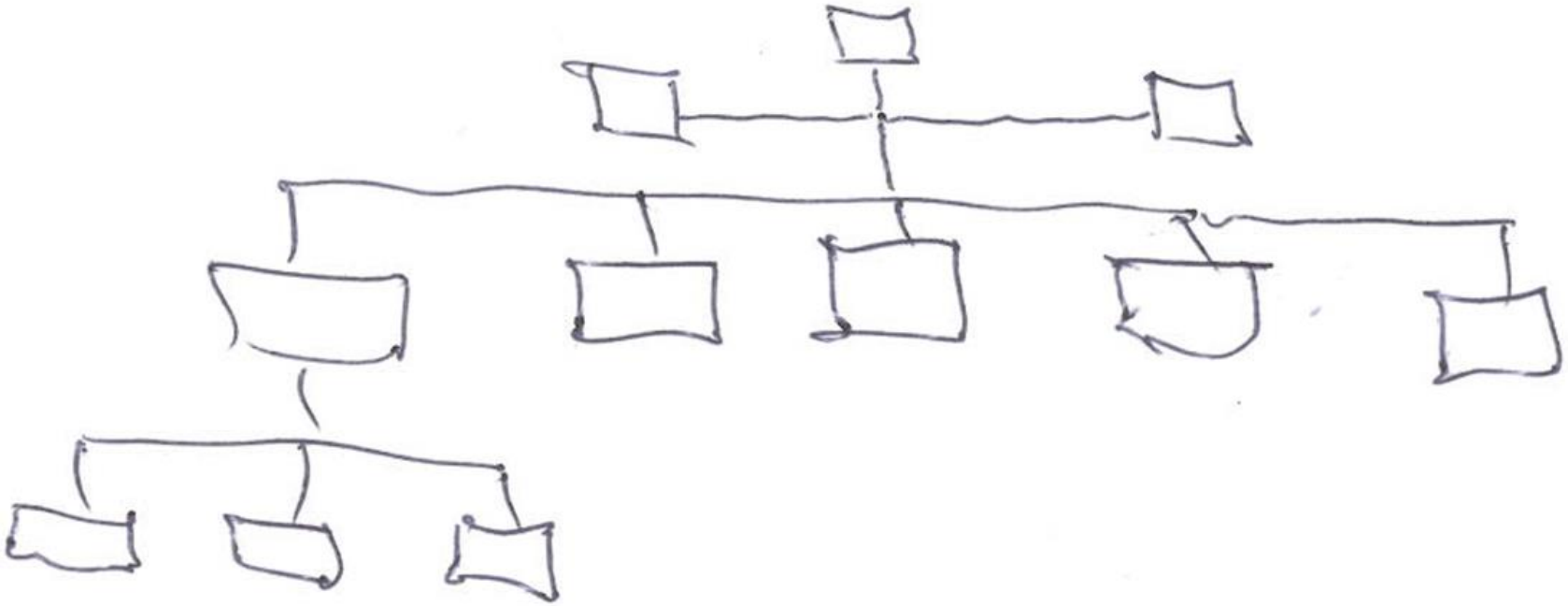
- **Participant Code: SE1**



- **Participant Code: SE2**



- **Participant Code: SE3**



4.5.2.4 Overview of State Emergency Management Agency Visual Findings

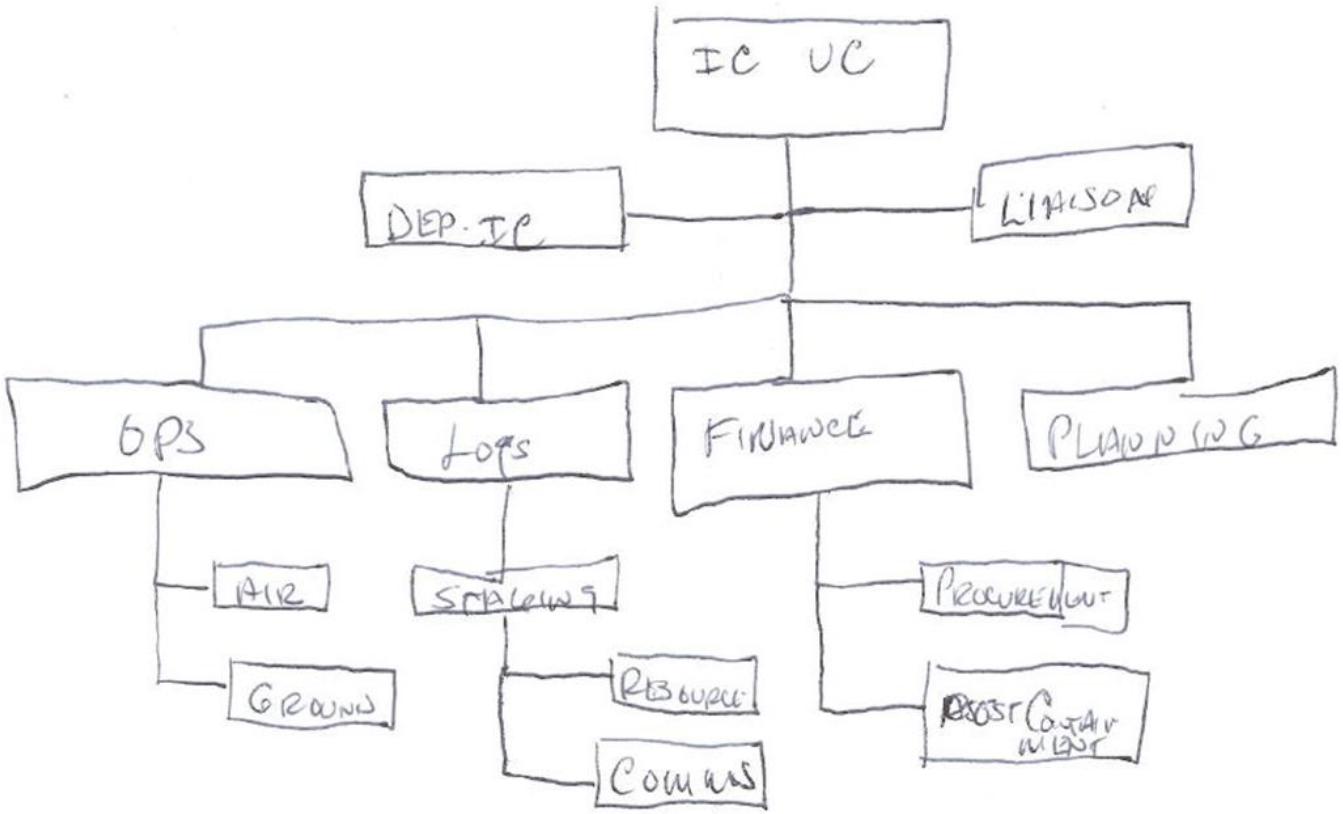
Operating under the direct authority of a governor, State Emergency Management Agencies (EMA) are tasked with ensuring the safety and welfare of their citizens (Larsen 2013, Sylves 2008). EMAs are subject to the Homeland Security Act of 2002 and HSPD5, and seek to implement NIMS/ICS at a state and local level by promoting compliance (Maryland Emergency Management Agency N.D.).

SE1, SE2 and SE3 all visualised Command and Control in organigram form, which loosely resembled the ICS framework. SE1 marked the Incident Commander at the apex of the hierarchy with safety and public information below; these sit above a single tier consisting of operations, planning, logistics and finance, which completed the diagram. SE2's diagram consisted of a single node at the top indicating the senior commander, which was split into 2 lower level organigrams. On the left is a 3-tiered hierarchy consisting of a command and 2 support nodes in charge of 4 subordinates, each of whom is in charge of 4 subordinates. This was linked upwards to the single command node and horizontal to another organigram, a 3-tiered hierarchy, which is also linked upwards to the command node. Interestingly, SE2 also offered a second separate image, with the commander at the centre of a spoke-wheel configuration of nodes, which is labelled as the traditional model.

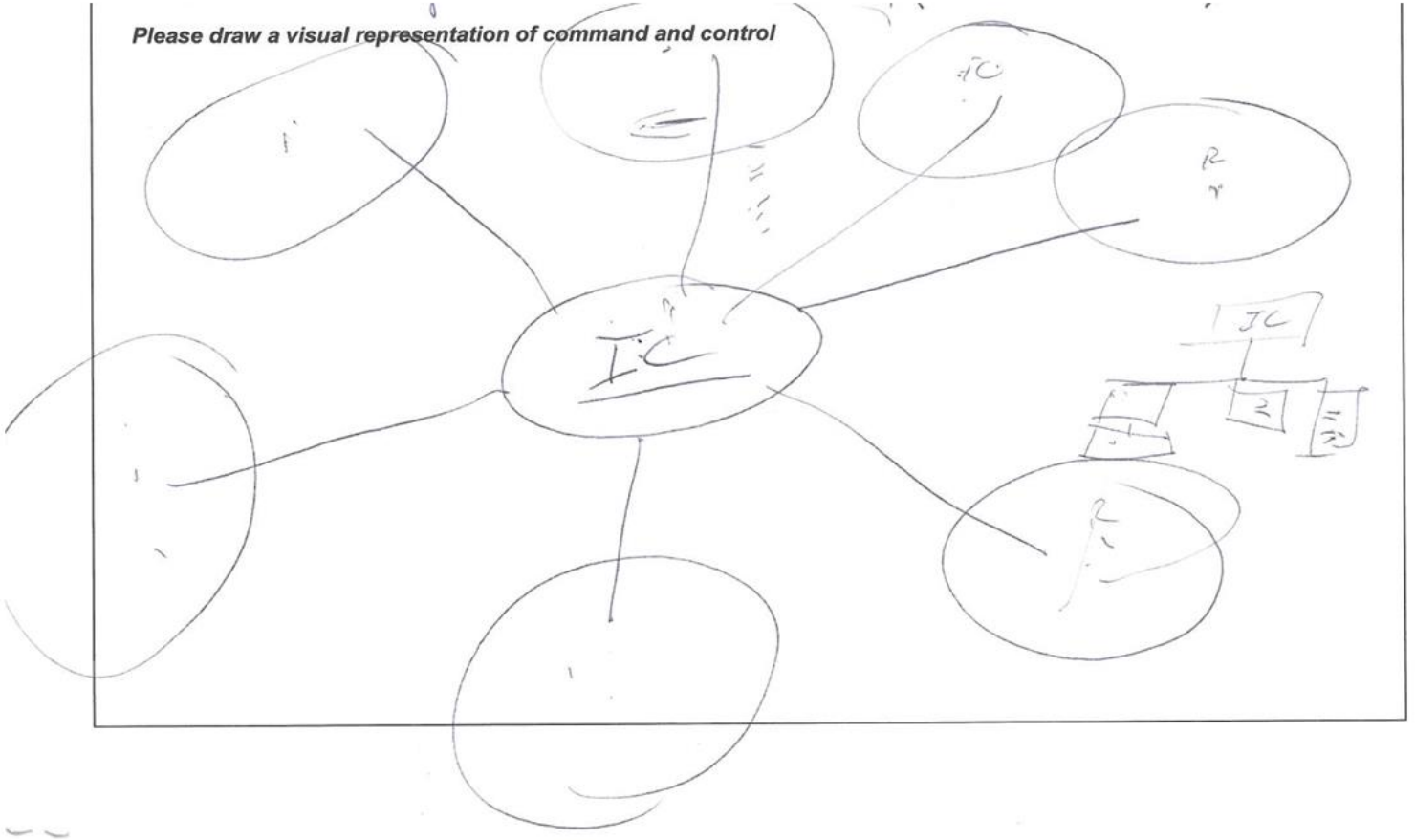
SE3 presented a blank organigram approach comprising of a 3-tiered hierarchy. There is a notional, though unmarked, commander with 2 support nodes at the apex of the hierarchy sitting above 5 subordinate nodes. The left most of these is noted as having command of 3 lower-level subordinates indicating a span of control of 1:3.

4.5.2.5 Law Enforcement

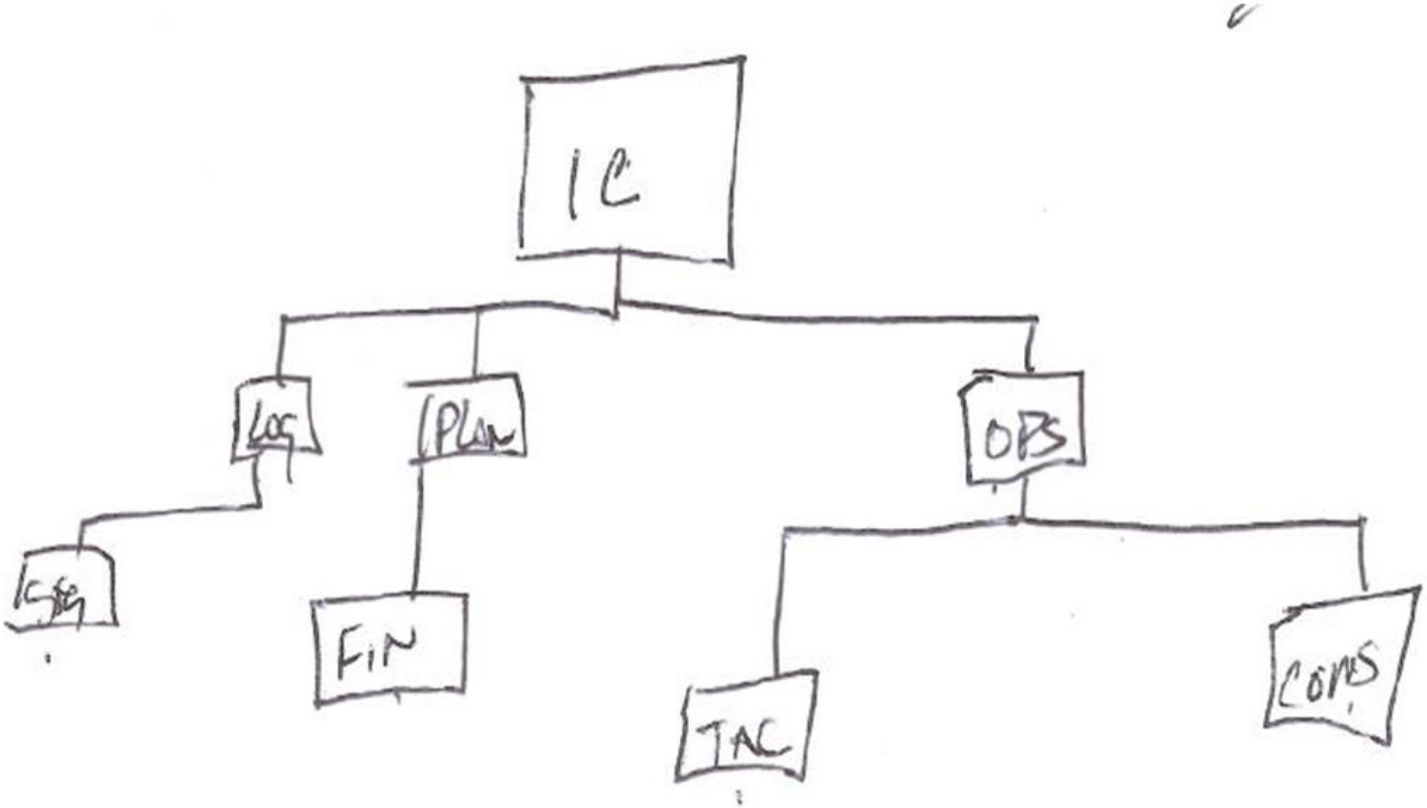
- **Participant Code: LE1**



- **Participant Code: LE2**



- **Participant Code: LE3**



4.5.2.6 Overview of Law Enforcement Visual Findings

Law Enforcement in the US can be a fragmented and jurisdictional affair made up of federal, state, county, sheriff and municipal agencies meaning that interoperability is a critical issue (Embassy of the United States 2015). Participants LE1 and LE3 drew similar organigrams, whereas LE2 employed a spoke-wheel configuration approach.

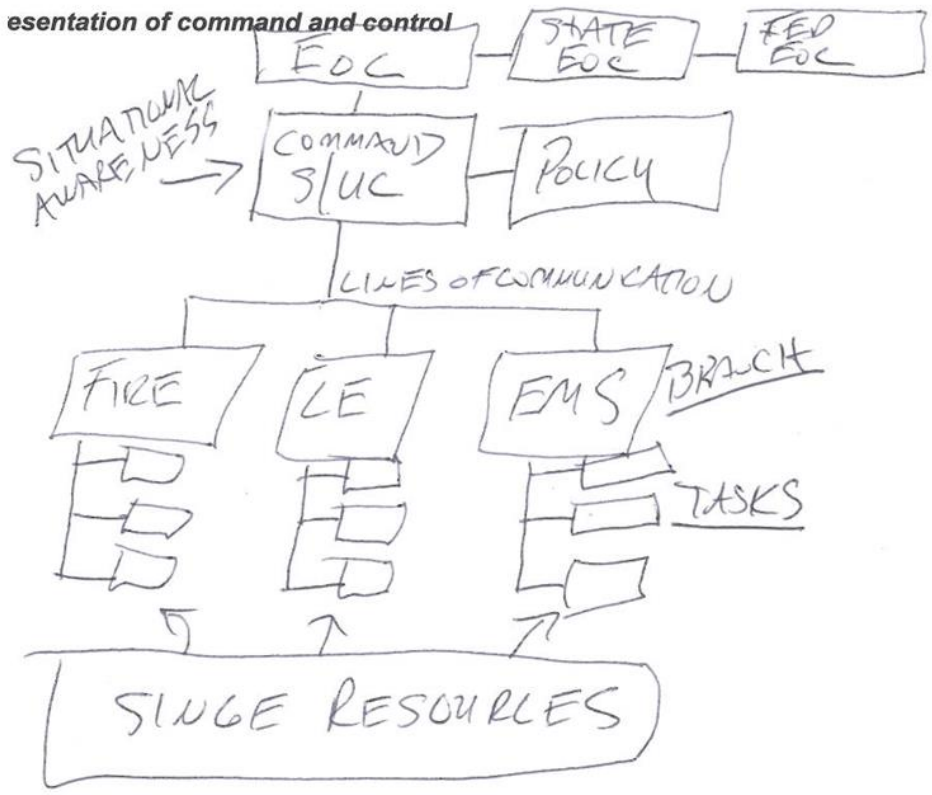
LE1 provided considerable detail by heavily annotating their diagram, which resembled the ICS framework. The incident commander or unified command, denoted by IC and UC, is marked at the top of the hierarchy in the centre of the page; below this is the deputy incident commander and liaison, which sit above the operations, logistics, finance and planning chiefs. The operations chief sits above the air and ground units, the logistics chief sits above staging, resources and communications and the finance chiefs sit above procurement and post containment.

LE2 placed the incident commander, denoted by IC, at the centre of a spoke-wheel configuration. The IC is encircled and linked to other outlying circles by lines, which represented communities impacted by a disaster. A circle, to the right of centre, has IO for Incident Officer marked, and there is also a small 2-tiered organigram to the right of the encircled IC, with the IC at the apex representing ICS, which was embedded within each circle. LE2 signified this by drawing a D from the centre of the circle below the organigram and *squiggles* within each subsequent outlying circle.

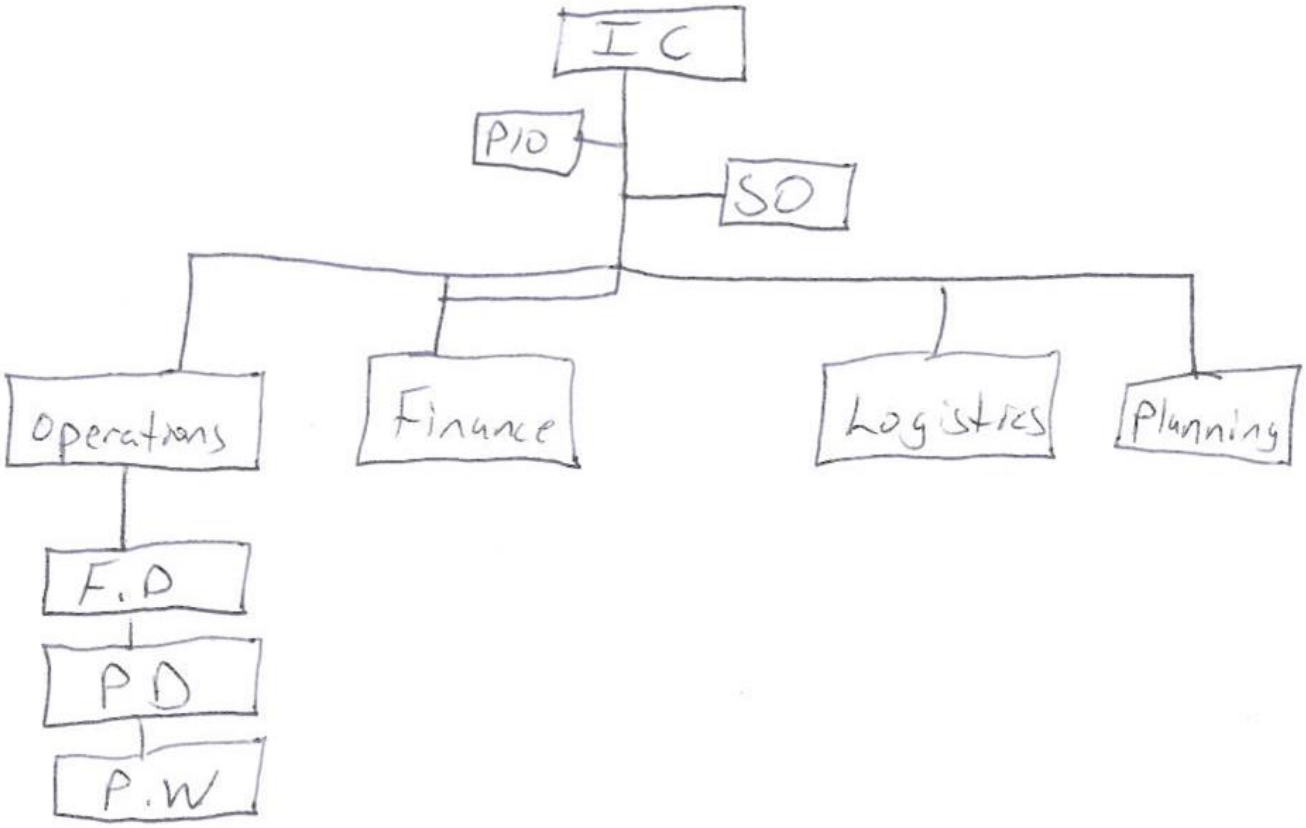
LE3 placed the incident commander, signified by IC, at the top of a 3-tiered organigram, which also resembled the ICS framework. The IC sits above a logistics node, which links to a lower node, planning is linked to a finance node, and operations to tactical and communications nodes, which are all, positioned lower in the hierarchy.

4.5.2.7 US Fire and Rescue

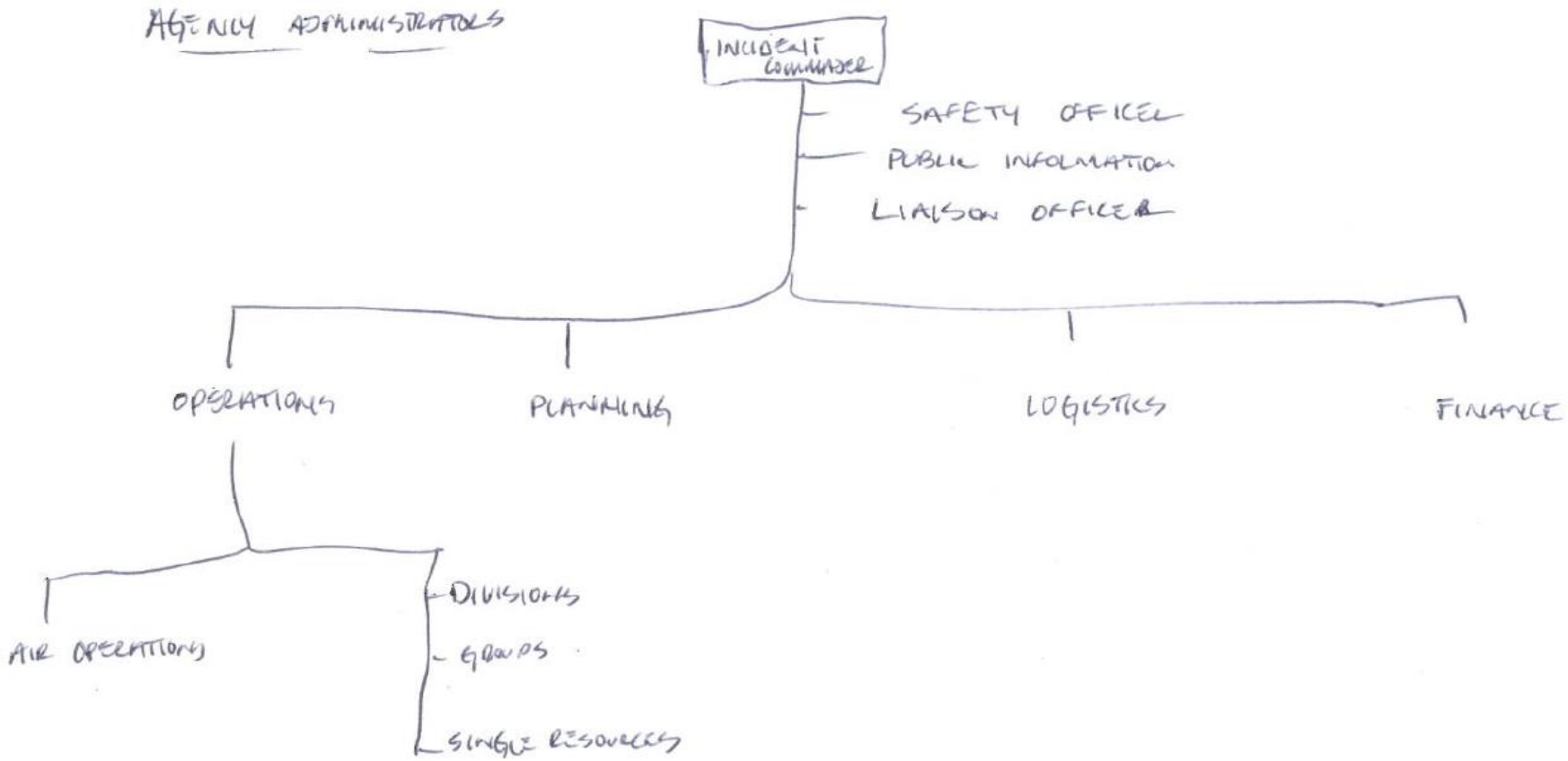
- **Participant Code: FR1**



- **Participant Code: FR2**



- **Participant Code: FR3**



4.5.2.8 Overview of US Fire and Rescue Services Visual Findings

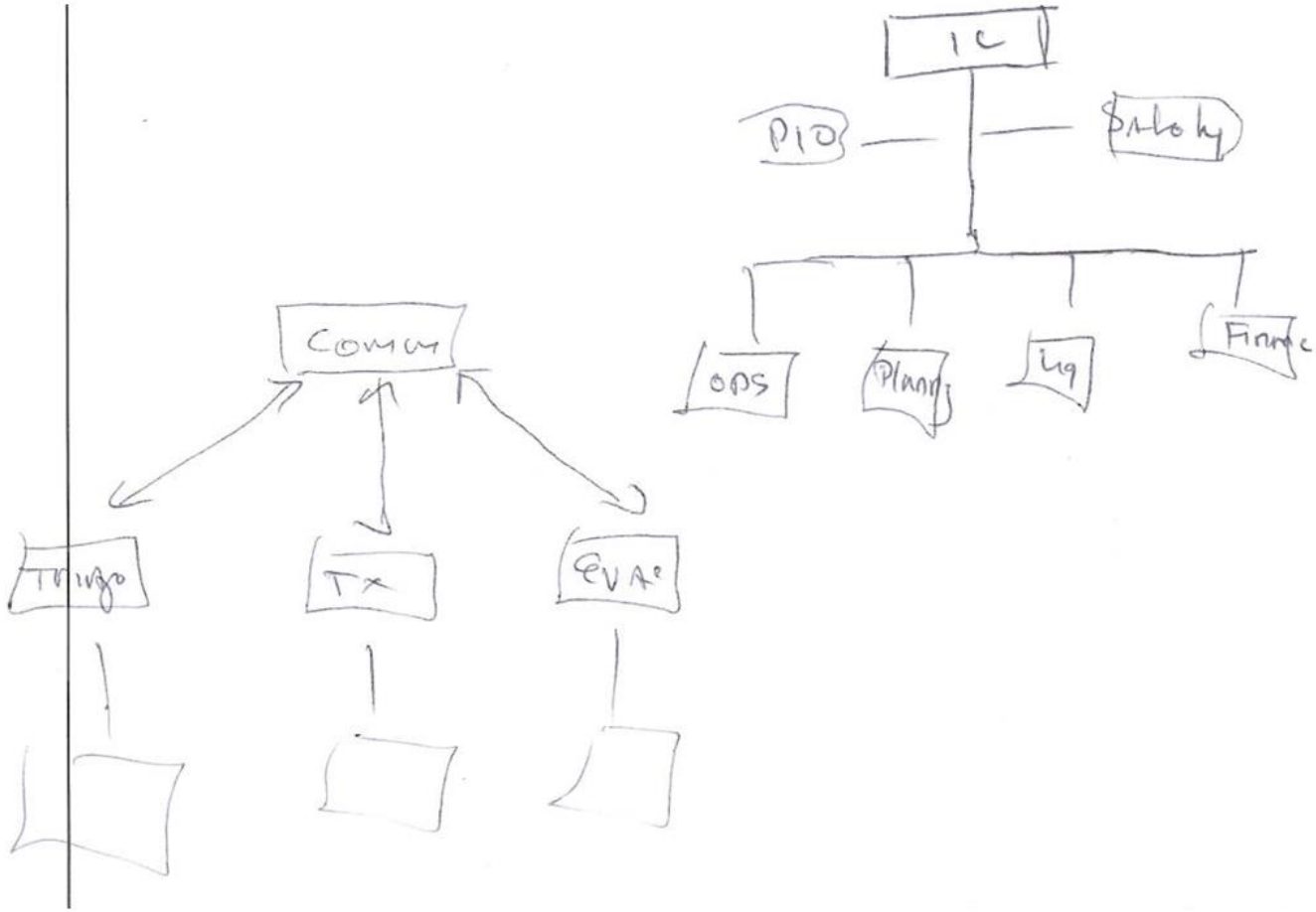
There are an estimated 30,052 Fire Departments in the US, which includes state forestry, municipal, private and volunteer agencies (Haynes and Stein 2014). ICS was initially developed by a group of 7 Fire agencies following extensive problems during the 1970 wildfire season in California; the group took the name Firefighting Resources of Southern California Organized for Potential Emergencies (FIRESCOPE) developing a system for on-scene multi-agency coordination that has subsequently become known as ICS (Cole 2000, Jensen and Waugh 2014, Moynihan 2007). The NIMS/ICS combination is the bedrock of US command and control and is built on the implicit assumption *"that first-responders, especially those in Fire Departments, support the ICS approach to response"* (Jensen and Yoon 2011) (p 1) though support for ICS within Fire services is not universal (Jensen and Waugh 2014).

FR1, FR2 and FR3 all adopted an organigram format similar to the ICS framework, though with some minor differences between interpretations. FR1 marked the local Emergency Operations Center (EOC) at the top of the hierarchy at the centre of the diagram, which was linked horizontally to the State EOC, which is in turn linked to the Federal EOC. The Local EOC sits above the command node, which can be either single or unified denoted by S/UC. This is supported by policy, which appears in a node to the right and situational awareness, which is listed to the left of the command node. Lines of communication connect Fire, Law Enforcement and Emergency Medical Services branch nodes, which are connected to smaller individual agency hierarchies marked as tasks, and a collective enlarged single node representing multi-agency single resources is connected into the bottom of the diagram with an upwards arrows.

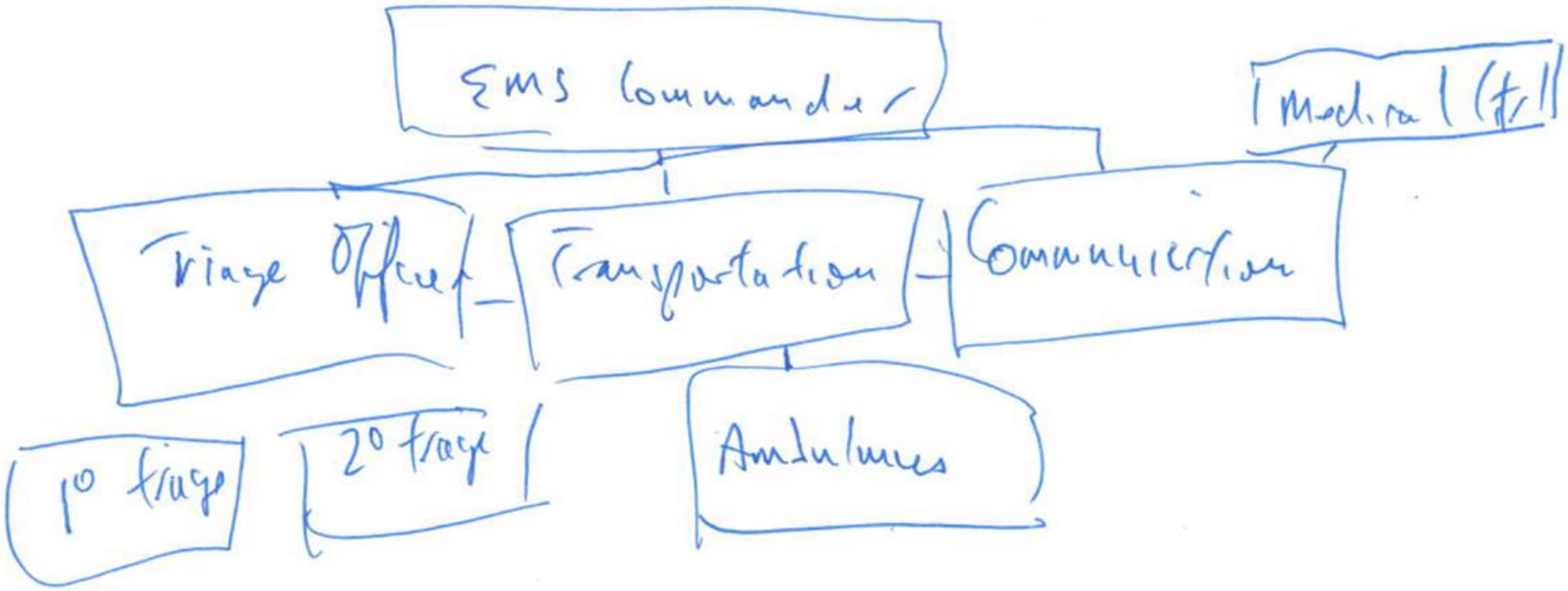
FR2 adopted an organigram approach with the incident commander (IC) appearing at the apex of the hierarchy supported by a public information officer (PIO) on the left and a safety officer (SO) of the right of the lines of communication. There are 4 subordinate sections; operations, finance, logistics and planning left to right, and marked below operations are the Fire Department, Police Department and Public Works in what seems to be a hierarchal order. FR3 also adopted an organigram approach with the incident commander appearing at the top of a 3-tiered hierarchy supported by a safety, public information and liaison officers. Lines of communication link the IC to operations, planning, and logistics and finance sections marked from left to right. Operations sit atop air operations and a further hierarchy denotes divisions, groups and single resources.

4.5.2.9 Emergency Medical Services

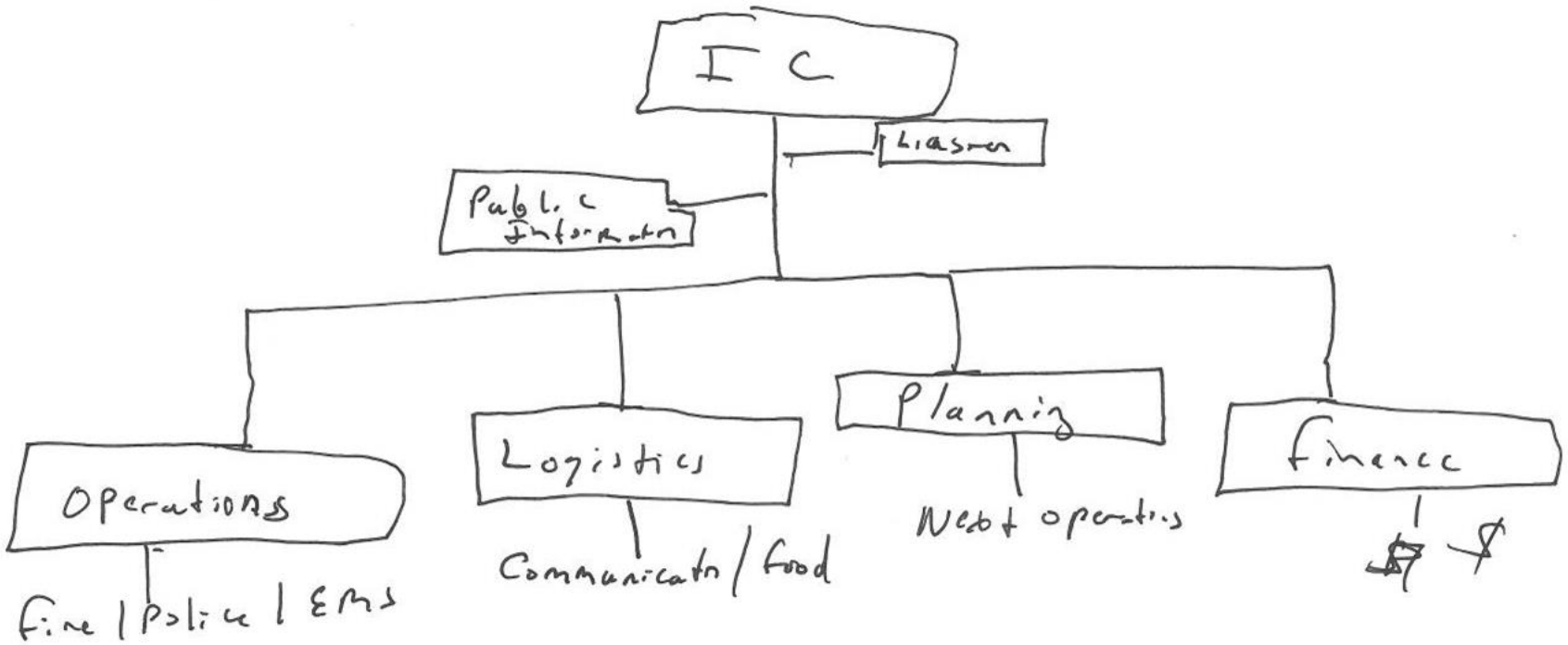
- **Participant Code: E1**



- **Participant Code: E2**



- **Participant Code: E3**



4.5.2.10 Overview of Emergency Medical Services Visual Findings

Emergency Medical Services in the US can be Fire Department or hospital-based, independent, private or voluntary services, and technicians and paramedics must be licensed to work within the state within which they are employed (Medic 911 2014, US Department of Transportation 2015).

E1, E2 and E3 all used organigrams, though there were differences in the respective diagrams. E1 presented 2 separate diagrams; the first was a 2-tiered representation of ICS, which was in the centre of the page. The incident commander (IC) is supported by a public information officer on the left and a safety officer on the right, who are placed above operations, planning, logistics and finance sections. The second image represents Command and Control at the scene; the commander appears at the top of the 3-tiered hierarchy above nodes marked triage, transport (TX) and evacuation (evac).

E2 also visualised Command and Control as a 3-tiered organigram. The hierarchy was conceptualised as single agency with the EMS Commander appearing at the top of the diagram linked by lines of communications to a triage officer on the left of the diagram. The triage officer has 1st and 2nd triage appearing below but not linked and was horizontally linked to transportation; this sits atop and is linked to an ambulances node and is in turn horizontally linked to communications, which is then linked to off-scene medical support which appears above and to the right.

E3 applied ICS producing an organigram with the incident commander (IC) at the top of a 3-tiered hierarchy. The IC is supported by public information and liaison officers, which appear on the left and right of the linking lines of communications. These are marked above operations, logistics and planning and finance, which are drawn from left to right across the diagram. The operations section is annotated with Police, Fire and EMS and, logistics with communications and food, planning with next operation, and finance with the $ symbol.

4.5.3 Visual Metaphor Analysis

4.5.3.1 Visual Metaphor Analysis – United Kingdom

Figs 4.29 and 4.30 below show the findings of the visual metaphor analysis process for the UK and US respectively. Each diagram was analysed according to the interpretative process outlined in the methodology to assess the metaphorical significance of the imagery. Each table lists the metaphor or metaphors noted in each diagram, source and a supporting narrative for each, and at the foot of each table is a summary count to identify the overall trends.

Fig 4-29: Visual Metaphor Analysis – United Kingdom			
Code	**Metaphor**	**Source**	**Narrative**
CG1	Organism	Morgan	Heart in the middle of the diagram
	Political System	Morgan	People circling the heart and table in the middle of the diagram
CG2	Status is Position	Master List	GSB/COBR - Higher levels of Command are positioned at the top of the image
CG3	Brain	Morgan	Process focused - top down perspective in which the process surrounds the situation
LG1	Status is Position	Master List	GSB/COBR - Higher levels of Command are positioned at the top of the image
LG2	Status is Position	Master List	Hierarchical diagram with senior levels positioned at the top of the image
LG3	Status is Position	Master List	Hierarchical diagram with senior levels positioned at the top of the image
P1	Status is Position	Master List	GSB - Higher levels of Command are positioned at the top of the image
P2	Status is Position	Master List	GSB Higher levels of Command are positioned at the top of the image
P3	Status is Position	Master List	GSB - Higher levels of Command are positioned at the top of the image
F1	Status is Position	Master List	GSB/COBR Higher levels of Command are positioned at the top of the image
F2	Status is Position	Master List	GSB floor plan - higher levels of Command are positioned at the top of the image with cordons surrounding the incident
F3	Status is Position	Master List	The team commander positioned at the top of the image
	Organism	Morgan	Command and Control is represented as a smiling face
A1	Status is Position	Master List	GSB floor plan - higher levels of Command are positioned at the top of the image with cordons surrounding the incident
A2	Progress is Forward Motion	Master List	A process based image with the progression moving from left to right
A3	Status is Position	Master List	GSB floor plan - higher levels of Command are positioned at the top of the image with cordons surrounding the incident

Metaphor	Source	Count
Status is Position	Master List	12
Organism	Morgan	2
Political System	Morgan	1
Brain	Morgan	1
Progress is Forward Motion	Master List	1

4.5.3.2 Visual Metaphor Analysis – United States of America

Fig 4-30: Visual Metaphor Analysis – United States of America			
Code	**Metaphor**	**Source**	**Narrative**
FE1	Status is Position	Master List	Hierarchical organigram with higher levels of command at the top of the image
FE2	Status is Position	Master List	Hierarchical organigram with higher levels of command at the top of the image
FE3	Status is Position	Master List	ICS - Hierarchical organigram with higher levels of command at the top of the image
SE1	Status is Position	Master List	ICS - Hierarchical organigram with higher levels of command at the top of the image
SE2	Status is Position	Master List	Hierarchical organigram with higher levels of command at the top of the image
SE3	Status is Position	Master List	Hierarchical organigram with higher levels of command at the top of the image
LE1	Status is Position	Master List	ICS - Hierarchical organigram with higher levels of command at the top of the image
LE2	Political System	Morgan	Spoke wheel configuration with the Incident Commander is depicted at the centre of a network of ICS nodes that may have differing goals
	Brain		An alternative interpretation of the diagram is that it represents a network of problem-solving, decision-making, communication and information processing nodes

	Status is Position	Master List	ICS - Hierarchical organigram with higher levels of command at the top of the image. However, this was a small addition to the main image added after completion of the initial metaphor indicating that it was not the initial conceptualisation
LE3	Status is Position	Master List	ICS - Hierarchical organigram with higher levels of command at the top of the image
FR1	Status is Position	Master List	ICS/State/Federal - Hierarchical organigram with higher levels of command at the top of the image
FR2	Status is Position	Master List	ICS - Hierarchical organigram with higher levels of command at the top of the image
FR3	Status is Position	Master List	ICS - Hierarchical organigram with higher levels of command at the top of the image
E1	Status is Position	Master List	ICS - Hierarchical organigram with higher levels of command at the top of the image
E2	Status is Position	Master List	ICS - Hierarchical organigram with higher levels of command at the top of the image
E3	Status is Position	Master List	ICS - Hierarchical organigram with higher levels of command at the top of the image

Metaphor	**Source**	**Count**
Status is Position	Master List	15
Political System	Morgan	1
Brain	Morgan	1

4.5.3.3 Summary of Visual Findings

The use of visual methodology produced rich imagery depicting 30 interpretations of Command and Control. 9 of the 15 UK diagrams directly applied the local-level GSB model and 3 of those also included the national level COBR structure. The other 8 images used significantly different approaches indicating a limited degree of standardisation. All 15 US participants represented Command and Control as an organigram, of which 13 had either visual or textual reference to the ICS on-scene management framework, indicating a higher degree of commonality than UK participants. Notably, only FR1 included local, state and federal levels of command. Interestingly, a key trend noted across both UK and US data sets was the prevalence of the Status is Position metaphor, which, despite some variation in the diagrammatic representation, indicated a shared hierarchical and top-down frame, which is highly significant and is revisited in chapter 5.

4.6 Chapter Summary

This chapter presented a range of findings collated and processed to achieve the stated Aim and Objectives. A review of how the presented findings address the CRQ and SRQs is provided below:

4.6.1 How the Findings Answer the Research Questions

The qualitative findings presented covered 3 aspects; thematic content and linguistic metaphor analysis was followed by the application of visual methodology.

The key content analysis themes were terminology and concept uncertainty, which resulted in frequent misunderstanding, miscommunication and misinterpretation, or to use a metaphor, organisations are simply *"not on the same page".* Whilst, leadership and relationships with other organisations were viewed as critical to success by US participants. Conversely, a single-loop learning process emerged as a key theme from the UK findings and this was also evident in the US findings but to a lesser extent. The view that Command and Control is essential was almost universal. Interestingly, this theme was not the highest in terms of total count because to question this notion seemed almost nonsensical; participants generally did not spend much time discussing it as to them the question seemed trivial and almost disrespectful. Responses include: S2: *"it's essential… absolutely… erm without it all you would have is chaos"* and LE2: *"oh yea absolutely".* Participants simply moved on without engaging in deeper discussion and a number laughed heartily before answering. This is a notable finding, illustrating the heavily embedded nature of the approach and a substantial barrier as any modification to Command and Control or implementation of alternative methodologies is likely to be heavily resisted. This was summed up by FE2 who stated, *"I think that the struggle that you will have is if you come*

up with a system other than Command and Control that works because… because it is firmly entrenched in the way people think it will be difficult to get them to change".

4.6.1.1 Addressing the Central Research Question (CRQ)

The sections below relate the findings to the CRQ and SRQ (see section 4.1) in order to build a comprehensive answer to these questions.

4.6.1.2 Summary of Findings

4.6.1.2.1 Research Question 1

- SRQ 1 asked: "*is Morgan's* (2007) *organisational metaphor theory relevant to UK and US emergency management?"*

The findings indicate that Morgan's metaphors are relevant to disaster research, thus answering both SRQ 1 and Objective 2, which sought to *"assess the relevance of Morgan's* (2007) *organisational metaphors to UK and US emergency management".* The simple answer to both is yes Morgan's theory is relevant as 90% (27-30) of sampled practitioners ranked 1 of more of the metaphors as relevant to their views of Command and Control. However, more importantly, the findings demonstrated a critical lack of consensus across key organisations in UK and US emergency management, which could potentially limit interoperability during multi-agency emergency response due to a fragmented understanding of Command and Control. These findings also demonstrated the communicative potential of metaphor to enhance understanding of Command and Control across the sampled organisations, and indeed a wider stakeholder base, which is explored in the following chapter.

4.6.1.2.2 Research Question 2

- SRQ 2 asked: *"what metaphors do UK and US emergency management practitioners use to make sense of Command and Control?"*

The findings presented both linguistic and visual metaphors to answer SRQ2. The empirical findings indicated that Morgan's Brain, Culture, and Machine, and to a lesser extent Political System metaphors resonate with practitioner's views of Command and Control. Furthermore, the triangulated linguistic metaphors drawn from the interview transcripts using Morgan's (2007) organisational metaphors, the Master Metaphor List (Lakoff, Espenson and Schwartz 1991) and the General category produced a diverse range of terms that offer an insight into the naturalistic language of emergency management that have resonance across multiple organisations. The use of metaphors such as Status is Position; Progress is Forward Motion, Natural World and Cooking, and others detailed in Figs 4.9 and 4.10 increase the likelihood of understanding when used conversationally in a multi-agency setting. Also, conceptual

metaphors such as Precious Metals, Candle, Spinning Plates, Golden Thread and Virus and Antidote that emerged during the interviews provided opportunities to develop learning tools that combined both linguistic and visual methodologies. These communicative tools, developed in the following chapter, were designed to enhance critical knowledge of Command and Control and push the boundaries of our understanding of the philosophy and capabilities of what is both the traditional (McEntire 2007) (p 105) and dominant (Dynes 1994) (p 142) approach to emergency management.

The findings also demonstrated the value of visual metaphor with rich imagery depicting how key practitioners interpret and make sense of Command and Control, illustrating the power of the visual domain (Pink 2012). Notably, there was variety and diversity between images, particularly within the UK data set. This indicated that understanding of Command and Control is somewhat varied corroborating and building upon the empirical and linguistic findings. There were areas of commonality particularly in the use of organigram methodology. Interestingly, despite some diagrammatic variability the Status is Position metaphor was dominant as it was noted in 27 of 30 or 90% of images demonstrating a strong hierarchical interpretation of Command and Control consistent with the traditional model (McEntire 2015).

4.6.1.2.3 Research Question 3

- SRQ 3 asked: *"Does understanding of Command and Control vary across key organisations in UK and US emergency management?"*

The findings demonstrated that there is variation in how Command and Control is interpreted illustrated by the range of metaphors used to express understanding of the concept. In a linguistic sense, a shared understanding was shown to exist through Morgan's (2007) Brain, Culture and Machine metaphors, and Lakoff, Espenson and Schwartz's (1991) Status is Position, Progress is Forward Motion, Natural World and Cooking metaphors. Within the visual findings 9 of 15 UK participants applied GSB and 13 of 15 US participants applied ICS methodology which emergency managers would likely cite as evidence of standardisation. Though, 8 of 30 did not interpret Command and Control using their respective frameworks.

Both GSB and ICS are local Command and Control frame-works, indeed ICS is for on-scene management (Cole 2000). Only 4 of 30 participants visualised the holistic national Command and Control frameworks detailed in Organigrams 1 and 2 respectively. The US findings suggest that ICS is seen as Command and Control rather than the full national framework of ICS and NIMS (Jensen and Waugh 2014, Jensen and Thompson 2015). Drabek (1986) (p 88) highlighted the risks and problems of a limited awareness of the whole Command and Control system, which remains the case some 30 years later. This lack of a holistic perspective is exacerbated by the absence of recovery from all diagrams. This clearly demonstrates that recovery is a cognitive afterthought despite being an integrated part of the respective Command

and Control frameworks, which supports Jensen et al's (2014) (p 157) assertion that *"recovery is subordinate to other functional areas (e.g. preparedness, response, mitigation)".* This is a concern for integrated emergency management moving forward, and needs to be addressed.

4.6.1.2.4 Research Question 4

- SRQ 4 asked: *"Do interpretational differences in Command and Control affect the level of interoperability between emergency practitioners?"*

A fragmented interpretation of Command and Control has been shown to exist through empirical, linguistic and visual methods. It is a vital concern as the lack of shared, and ideally holistic, view can perpetuate an individualistic silo-mentality. This was a key theme identified as having a significantly negative effect on multi-agency Command and Control, which can ultimately lead to needless loss of life. LE3 stated *"still to this day law enforcement doesn't want to give fire information, fire doesn't want to give law enforcement information, EMS can't give information because of private rights patient rights"* and *"I can give you a hundred examples of police officers getting killed because they didn't have that information before they went in and that's sad and we… we need to fix that I mean all you have to do is look at the newspaper… police officer killed because of an ambush, police officer killed because of…".* In order to develop future synergies and efficiencies, and to help alleviate some of these problems, the findings herein have been used to develop a suite of learning tools. These were designed to advance and link theory to practice by advocating self-awareness of one's own interpretations and knowledge of Command and Control, develop critical insights and provide an effective mechanism to communicate these in a multi-agency context. The following chapter discusses the significance of the findings, and develops a suite of learning tools based on the research findings.

5 Discussion of Findings

5.1 Introduction

This chapter consists of 5 sections; an introduction followed by discussions of the empirical and content analysis findings so as to develop a critical insight into the key issues that emerged from the data. These insights are then built upon in the third section, which is where this study's principal Contributions to Knowledge are presented. The content analysis themes and the metaphor analysis findings are interrogated for their significance in relation to both the literature and practice. Elaborating on these, a novel framework is proposed for addressing key issues identified, namely, the Command and Control Interoperability Tool Box or CCIT-Box. This suite of learning tools was designed to support learning by promoting deeper critical knowledge and understanding of Command and Control through the use of linguistic and visual metaphor-based techniques to fill gaps in knowledge identified within this study. The tools presented address specific issues by linking theory to practice in an accessible mechanism, the individual tools constructed and issues focused upon are outlined below:

1. Interoperability Metaphor Analysis (IMA): variable interpretations
2. Visual Metaphor Analysis (VIA): variable interpretations
3. Theory of Interoperability Metaphors (TIM)
4. A Candle: the limitations of Command and Control
5. A Trivial Pursuit Pie: barriers to interoperability
6. The Golden Thread: the spine of Command and Control
7. Spinning Plates: maintaining span of control
8. A Vaccine: an alternative perspective

Key to the success of the CCIT-Box is its future development; it must be continually shaped, refined and added to over time. This is to ensure that it will remain a *"living and breathing"* entity in the same way an emergency plan needs to continually evolve (Alexander 2002a, Swope and Patton 2005). Please note: the narrative herein, whilst critical does not represent a criticism of participants, and thus should not be construed as such. The author holds each individual in the highest of regard, their experiences, professionalism and dedication to duty flowed throughout the interviews. The field-study was a truly inspiring experience; indeed, the author was often humbled when participants shared their experiences and it was a privileged to hear their stories. What follows is a critique of the methodology; theory and practice that underpins Command and Control intended to develop knowledge.

5.2 Review of Morgan's Metaphors Framework

The empirical findings based on the application of Morgan's (2007) metaphors demonstrated that interpretations of Command and Control were fragmented, with views lacking a standardised frame. However, some commonality existed based around the Brain, Culture and Machine metaphors, illustrating the ability of metaphor to unlock deeper meaning (Lakoff and Johnson 2003, Lambert III 2009, Morgan 2007). The findings demonstrated that Cornelissen and Kafouros' (2008a) view of metaphor as the primary means of conceptualising organisations also applies to disaster research. Furthermore, the non-literal analytical process enabled a deeper more meaningful understanding of how practitioners make sense of Command and Control, which validated the use of metaphor (Morgan 2007, Renz 2009).

The lack of a dominant metaphor or rather a fully standardised view of Command and Control suggests that key organisations are not currently as interoperable as they would like. This validates the push to embed the Joint Doctrine: the Interoperability Framework in the United Kingdom (UK), and NIMS in the United States of America (US) advocating that more needs to be done (Department of Homeland Security 2008, H.M. Government 2013h). However, research has shown that potential for standardisation is low, which limits the utility of these initiatives (Drabek 1985, Jensen and Youngs 2015). Consequently, a greater understanding of Command and Control is needed.

5.3 Discussion of the Content Analysis Findings

The following section focuses on the 18 UK and 28 US content analysis themes, which summarily represent the key emergent issues.

5.3.1 The Air that Emergency Managers Breathe

The findings clearly demonstrated Command and Control's dominance (Dynes 1994). Practitioners see it as the central pillar on which the field is based, rightly or wrongly, as its limitations are well known. Wenger, Quarantelli and Dynes (1990) (p 8) note, *"the diffusion of the model has been so rapid and extensive that its acceptance has a number of the characteristics that social scientists associate with fads"*. Indeed, Waugh (2009c) (p 172), emphasises Craig Fugate's complaints of *"ICS zealots who insist on trying to fit circumstances to the technique"*. The findings and the literature demonstrate the speed and depth to which Command and Control has embedded within the field which, collectively indicate that it is has evolved into something more.

Based on the findings, the author posits that since the emergence of the current frameworks in 1970s (Anderson and Adey 2012, Bigley and Roberts 2001, Hills 1994, Jensen and Thompson 2015), Command and Control has grown beyond a mere fad, and can be said to be almost *"the air that emergency managers breathe"* as it dominates thinking and conceptual framing of emergency response. To a certain extent, it has come to represent emergency management

in an un-reflexive almost unseen nature as evidenced by the quotes in Fig 4.4 and notably: by FE3 below

- FE3 (US): *"(Laughing) yep absolutely I don't think there's any question that it's almost like erm the engineer on the ship if he's doing his job erm all things are going well and you have that capability nobody really thinks about it but if he's if he's got a capability is deficient erm everybody is complaining and I'd make that analogy to erm Command and Control"*

The key point is that *"you have that capability nobody really thinks about it",* similar to breathing generally nobody really thinks about it until your respiratory system is impaired or you start to run out of air (Ionescu 2013). Breathing is a natural part of the body's automatic systems, though it can be controlled manually through conscious intervention if necessary. The findings indicate that Command and Control's use has evolved to the point whereby practitioners consider it so essential that it is only noticed when it fails which has significant implications for systemic learning. Quite simply, people do not generally focus on breathing unless there is a specific need to do so; it is taken for granted an automatic function. In this vein, awareness is not as overt as perhaps it should or could be as it presently forms part of the underlying cognitive-systemic fabric of practice: it is the automatic frame. In all but 3 interviews participants would not engage in discussion outside of dominant paradigm. Indeed, Neal (2014) (p 3) cautions that *"emergency management is more than response, and it is not Command and Control"* indicating that this cognitive embeddedness is limiting, or at least restricting critical thinking, echoing the conceptually narrow response-centric days of the pre-1970s (Blaikie and Wisner 2004, Coetzee and van Niekerk 2012, Lewis, Phillip and Westgate 1976, Stehr 2001, Twigg 2004).

5.3.2 The Essential Nature of Command and Control

Command and Control is regarded as almost sacrosanct. Gold, Silver and Bronze (GSB) and the Incident Command System (ICS) according to Waugh (2009c) exhibit classic Weberian traits. They are centralised, militaristic hierarchies open to the classic Weberian critiques of inflexibility, slow and cumbersome decision-making and lacking the adaptability to cope with fast moving and uncertain environments typified by disaster (Anderson and Adey 2012, Bigley and Roberts 2001, McEntire 2015, Waugh 2009c). The militaristic origins and intrinsic nature of Command and Control play an important factor in explaining why practitioners view the model as being so essential. Military organisations instil a high degree of loyalty and faith in the chain of command through doctrine and training: however, Wenger, Quarantelli and Dynes (1990) (p 12) argue *"variants of Command and Control models often create the illusion of effectiveness by ignoring a number of issues outside the system"*. This suggests that the systemic faith is to a certain extent blind, as participants are either unable or unwilling to look past the existing model, associated practices and the underpinning theoretical paradigm. Furthermore, Wenger,

Quarantelli and Dynes (1989), and Perry (2003) note that disaster response organisations regularly talk of Command and Control but question their understanding and actual use of the framework. This raises an interesting question of whether or not it is actually essential or just perceived to be so? However, answering this is beyond the scope of this study and as such is a candidate for future research. See Fig 4.4 for the related quotes.

Unwavering faith to a doctrine is questionable, particularly so in emergency management when life is on the line. CG3 stated *"we're very clear that doctrine is for the guidance of wise men and the blind adherence of fools".* This snappy quote was proffered by a senior UK Central Government representative and clearly implies a level of doctrinal flexibility. However, in the UK it is mandated by the Civil Contingencies Act (H.M. Government 2004c) so legally speaking there is no opt out, there is no alternative and doctrine by its very nature is there to be followed. However, Command and Control's perceived essential nature is explainable. Humankind has an extensive historic closeness with disaster. Our development as a species was intertwined with disaster in both a social and physical context, which resulted in a collective familiarity with disaster. This social closeness masks our lack of knowledge due in part to the relative newness of disaster research in comparison to other more established academic disciplines (Scanlon 1988, Tierney 1998). This coupled with perceived systemic benefits embedded by a militaristic sense of loyalty ensures that Command and Control exerts and un-due hold because on some level practitioners want to believe in the system. When disaster occurs this belief offers comfort, which inadvertently restricts the collective ability to think beyond Command and Control. This is not to say that faith in such frameworks is entirely misplaced as these frameworks have their uses. The issue here is the sole reliance on a single methodology as the basis for disaster response. It is essentially putting all your eggs in one basket without critically evaluating the strength and capability of the basket.

Participants were refreshingly open on the strengths and weaknesses of Command and Control, and the merits of the underpinning policies and procedures. There were numerous discussions on lessons learned and not learned which validated Pollock's (2013) research on persistent lessons identified, but not subsequently addressed. Herein is a significant barrier to advancement; whilst the professionalism, dedication and expertise of the participants is unquestioned their willingness and indeed ability to think beyond Command and Control is. The issues and concerns they raised generally focused on communications and technology in the first instance, for example:

- A3 (UK): *"we don't even dispatch in the same way"*
- LE2 (US): *"The biggest improvements for Command and Control would be erm enhanced (communications) interoperability if there's a way that they can come up with the money to do some enhanced capabilities"*

The quotes above are indicative of the issues and recommendations. Whilst all were constructive and insightful they remained within what can be termed a single loop learning process (Argyris 2002, Houchens et al. 2012). Participants never questioned whether Command and Control was the right methodology for disaster response. Indeed, FE3 stated *"I think knowing… the whole organisation knowing that it's the right thing to do*" illustrating a strong feeling that Command and Control is the right way of doing things.

5.3.3 Order out of Chaos: Understanding Scale and Complexity

Enabled by the conversational style, the author sensitively introduced critiques of Command and Control into the interviews at appropriate junctures and used the induced conceptual metaphors (see chapter 6) after they emerged to stimulate critical discussion. Participants engaged actively, showing interest in the critiques. However, the narrative was brought back within the existing Command and Control paradigm with a simple *"there's always got to be someone in charge"* or *"you need to organise the chaos"* statement in all but a handful of the interviews. The notable exceptions were FE2 and S3, who were very senior, educated, and highly experienced practitioners, and E3 who was relatively young but had experience across multiple agencies. However, all other interviews stayed framed within Command and Control methodology. Participants acknowledged the logic of the critiques and some asked for copies of the relevant journal articles, but the Command and Control paradigm remained dominant and in many cases actively protected.

The belief that *"you always need someone in charge"* was akin to a get out clause albeit a logical one that resonates closely with the principal ethos of Command and Control methodology. Within the military value system there is a stringent faith in the chain of command; on operations when *"all hell breaks loose"* the embedded cultural ethos of *"leave no one behind"* and faith in command to uphold this sacrosanct value provides comfort and strength to soldiers (Halvorson 2010). However, the notion of a single incident commander is contrary to Quarantelli's (2002) (p 1) synopsis of 40 years of disaster research. He unequivocally states *"they find it unrealistic to think that anyone at the height of a crisis could be in charge given the lack of information, conflicting and incorrect rumours, and the diversity of the many groups involved in such situations".* Furthermore, the work of Quarantelli (2006), Wachtendorf et el (2013) and Bissell (2013) on catastrophes, and Lagadec's (2007) theory of hyper-complexity indicates that it is highly unlikely that someone will be in charge given the scale and scope of many *"disasters"* and *"catastrophes"*, and Bissell (2013) (p 6) states *"that modern social and economic systems are so thoroughly intertwined with multiple diverse actors that no single command system will be effective in bringing all needed resources to bear on a response".* These perspectives undermine any notion of a single incident commander being in overall charge: however, the belief in this need was strongly noted in the findings. This divergence between practitioner and academic perspectives can however be explained through faith in the system, reinforced by the tried and tested theme, in that when disaster strikes having

or rather believing that someone is in charge can provide reassurance, even if scholarly research has proven this to be an unrealistic expectation. This, in turn, is linked to the hierarchical and militaristic nature of Command and Control, and an assumption that someone will be coming to the rescue, which is not always the case. US Emergency management, in particular, advocates that you may be on your own for up to 72 hours, in reality it may well be longer (Bissell 2013, Federal Emergency Management Agency 2007, Quarantelli 2006).

The concepts of scale and flexibility were key themes, participants believed their respective frameworks to have the ability to adapt to any given scenario however, bounded within this was a simplistic top-down *"the bigger it gets throw more resources at it"* mentality (Bissell 2013). However, the incident scale theories forwarded by Rohn (2009), Fischer (2003), Quarantelli (2006) and Bissell (2013) posit that as the scale increases from disaster to catastrophes and beyond, the level of devastation caused is so huge that help is either injured, dead, engaged elsewhere or simply cannot get there no matter how great the resource base, as evidenced during the responses to Hurricane Katrina and the Tohoku earthquake and tsunami (Committee on Homeland Security and Governmental Affairs 2006, United States Geological Survey 2011). Furthermore, Jensen (2009) (p 229) points out *"urban area disaster response frequently exhibits convergence, where many organizations and resources arrive to the disaster site simultaneously making the disaster response complex".* This is true in many incidents, though in the most severe of *"catastrophes"* emergency responder movement is extremely limited as scores of personnel are killed or injured. They are unable to fulfil their duties and due to infrastructure damage the road networks are often degraded or impassable even if they are able to respond, consequently vital mutual-aid is delayed as response time and distance between resources and personnel are exacerbated by the scope and scale of destruction (Jensen 2009, Quarantelli 2006). Lagadec (2007) (p 1) effectively sums this up arguing *"recent catastrophic incidents repeatedly have overwhelmed traditional mechanisms for crisis planning and management, and made them instantly obsolete, in several respects. The challenge of the "unthinkable" – this series of events has clearly shown that complex Western societies today are not equipped to confront major crises effectively".* Worryingly, these findings indicate the existence of a significant gap between research and practice, which is why a double loop learning process has yet to develop within the field. Despite, known limitations within academia, Command and Control as a conceptual model is strongly believed by practitioners to be essential, consider FR1's remarks: *"you have to have Command and Control because in our business people get hurt and killed if you don't".*

This visceral and emotive quote clearly articulates the sentiment and logic that informs the continued hold of Command and Control over the field. It is considered as essential as it is ostensibly designed to avert a perceived breakdown of order and a slip into chaos. Indeed, Schneider (1992) (p 143), argues that *"it is unrealistic to expect that state and local officials will be able to carry out their pre-established duties when there is chaos and extreme disruption*

permeating the immediate environment" perpetuating a myth that chaos follows disaster. Whilst Schneider's initial point regarding difficulties undertaking pre-established duties is valid, research has repeatedly demonstrated that chaos in disaster is to a certain extent a myth, albeit one with a strong influence that pervades media and policy narratives (Barton 1969, Dynes 1994, McEntire 2015, Neal 2014, Stallings and Quarantelli 1985, Tierney, Bevc and Kuligowski 2006). However, despite a general awareness of this myth within the literature the belief that disaster results in chaos emerged in the findings as is demonstrated by the Order out of Chaos quotes in Fig 4.5. A review of the quotes in Fig 4.5 demonstrates an underlying narrative consistent with Dynes' (1994) (p 142) dominant model and McEntire's (2015) (p 112) traditional model. Significantly, the findings established that in the field the strengths of the model are more clearly understood than the weaknesses. This augments the earlier single loop learning process finding advocating the need for enhanced critical knowledge. To aid clarity and readability a brief synopsis of the strengths and weakness' of McEntire's traditional model is provided in Fig 5.1 below:

Fig 5-1: Strengths and Weaknesses of McEntire's *"Traditional"* Model	
Strengths	**Weaknesses**
1. War may have the most adverse impact of any disaster	1. Natural and technological disasters are more common
2. Government is an important factor in disaster response operations	2. Government is not the only actor in disaster response operations
3. Standard Operating Procedures (SOP) provide logical guidelines for routine emergency situations	3. SOP's cannot provide guidance in all types of disaster situations
4. Hierarchy and orders may save lives and help to get things done	4. Top down structures may be slow or hinder the response
5. The desire to bring order to disaster is natural and to be expected	5. There may be order in chaos
Adapted from: (McEntire 2015) (p 112)	

That Command and Control is considered both essential and as bringing order to chaos illustrates the continued hold of the traditional model on practice. The strength of this view demonstrated a lack of awareness of McEntire's critique which supports Jensen and Waugh's (2014) (p 7) argument that the order out of chaos view is prevalent amongst US practitioners as it is believed to provide a number of systemic benefits including communications, leadership, and efficiency and responder safety. It is interesting to note that these benefits are seemingly widely known and espoused but the intrinsic methodological weaknesses are not. The literature notes a transition towards the *"professional"* model (Kapucu 2008, McEntire 2007, McEntire 2015, O'Leary and Blomgren-Bingham 2009, Waugh 2009c). This aligns with this study's findings as leadership and relationships in both the interpersonal and multi-agency context

emerged as important themes. This is not unexpected given the importance and relative size of the leadership and collaboration literature in both the disaster and wider business and management fields (Agranoff 2006, Avery 2004, Bass 1985, Crichton, Lauche and Flin 2005, Flin and Arbuthnot 2002, House et al. 2002, Kapucu 2008, Kapucu and Van Wart 2008, Kapucu 2009a, O'Leary and Blomgren-Bingham 2009, Tannenbaum and Schmidt 1973, Waugh and Streib 2006). However, though it was not covered in the literature review, due to its broader importance within the discipline and its emergence within the findings the author would be remiss for not acknowledging its existence. However, Wilson and Gosiewska (2014) (p 633) argue, *"that little has been written about the training of leaders to handle major incidents"* and, Salmon, Jenkins and Walker (2011) and Borodzicz (2004) noted that research into the selection and training of crisis team leaders is lacking, suggesting that more research in this critical area is needed.

The study's findings indicated a clear gap in knowledge relating to the sociology of disaster. This demonstrates that the sampled participants, all of whom hold key roles in both UK and US emergency management, exhibited limited knowledge of the extensive body of disaster sociology research that argues that *"there may be order in chaos"* (Britton 1988, Drabek and Evans 2007, Drabek and McEntire 2002, Dynes 1970, Dynes 1973, Dynes, De Marchi and Pelanda 1987, Fischer 2003, Forrest 1988, Kreps 1984, Quarantelli and Dynes 1977, Quarantelli 1986, Schneider 1992, Stallings and Quarantelli 1985, Stallings 2005, Tierney 1998). This is a critical weakness in the assumptions on which Command and Control is based, and in how emergency response operations are conceptualised, building on the findings of Groenendaal, Helsloot and Scholtens (2013), and Jensen (2011) (p 12) which *"seriously question the assumptions upon which NIMS is based"*. Furthermore, Schneider (1992) (p 135) emphasises, *"the key to a successful governmental response depends upon the extent to which post disaster human behaviour corresponds to prior governmental expectations and planning"*. However, as practice is not fully informed by the significant body of academically sound disaster sociology research a knowledge gap and operational vulnerabilities clearly exist as the policies, standard operating procedures and practices based on this limited perspective are not based on the reality of what actually happens post-disaster. In that sense, existing Command and Control frameworks, such as GSB and ICS, are more frameworks for what practitioners want to happen post-disaster rather than frameworks for what will actually happen as they based on *"false-assumptions and inappropriate analogies"* (Dynes 1994). Thus, they are theoretically limited in what they can achieve when faced with the most severe of *"disasters"* and *"catastrophes"* (Bissell 2013, Quarantelli 2006).

The findings indicate that GSB has becomes a metaphor, similarly ICS/NIMS has become the generic brand for Command and Control much in the same way that the Dyson, and Hoover before it, are used as generic terms for all types of vacuum cleaners (Lincoln and Thomassen 2009) (p 117). However, Command and Control is much more; the frameworks are applications

of the underlying philosophy and indeed *"NIMS is broader in scope, (and) claims to be applicable in all phases of emergency management"* (Jensen 2009) (p 222). This creation of a brand identity raises potential problems. Consider LE1's comment when asked about the origins of Command and Control:

- LE1 (US): *"That's a good question erm I'd say probably the military if I you know from my stand point I'd say it probably started in the military as far as the ICS portion goes that originated around 9/11 when we had the terrorist attacks on 9/11"*

Whilst the quote indicates an understanding of the militaristic origins of Command and Control, the reference to ICS developing post 9/11 is in fact incorrect, as we have seen within the literature review it developed much earlier in the 1970s (Cole 2000, Federal Emergency Management Agency 2004). However, from a certain perspective there is an element of truth in the statement if you consider NIMS as the new brand of ICS, indeed it is a key component of the NIMS framework. ICS may be viewed as a re-branding of the National Interagency Incident Management System (NIIMS) of 1982; which evolved from FIRESCOPE of 1973, which was informed by the early 1970s Phoenix Fire Department Fire Ground Command System (FGC). Consequently, from a marketing perspective the US Command and Control brand has been frequently refreshed. The psychological effect of this is that Command and Control feels new, which can limit theoretical maturity and inadvertently promotes a lack of criticality as on account of an oxymoronic perceived sense of newness given that it is also the traditional model (Gunelius 2015, McEntire 2015). Arguably, a purpose of the roll-out of the National Response Framework (NRF), which replaced the National Response Plan (NRP) in 2008, was a re-brand to raise public confidence, though there were functional changes within the document (Federal Emergency Management Agency 2008a). Indeed, the general level of awareness of the origins and development of the respective Command and Control frameworks, and Command and Control itself was inconsistent. The UK findings demonstrated only a vague awareness of the origins of the GSB framework. P2 was the only UK participant with clear knowledge of when and how the framework evolved, though there was a general awareness of the military origins of the underlying principles. Notably, CG2 stated rather defensively:

- CG2 (UK) *"I don't know okay… there's no necessary reason for me to know that"*

Conversely, the US sample-frame demonstrated a more generalised and collective understanding of the origins and evolution of the US Command and Control framework. However, there were still variations in the level of understanding that ranged from post 9/11, to the military to Moses and the Ten Commandments meaning a consistent understanding was lacking. So, while Command and Control is heavily embedded in the field, and considered essential it is not critically understood beyond a seemingly practical application. It can be

argued that perhaps the regular periods of flux caused by policy and legislative changes, such as the UK Civil Contingencies Act (2004), the US Homeland Security Act of 2002 (107th US Congress 2002) and the Post Katrina Emergency Management Reform Act of 2006 (107th US Congress 2002, H.M. Government 2004b, National Emergency Management Association 2006). And, national policy initiatives such Joint Emergency Services Interoperability Programme (JESIP) and National Incident Management System (NIMS), though well intended and productive to a certain extent, actually stymie critical evaluation and understanding of the fundamental principles of Command and Control as these policies inadvertently restrict thinking to learning new ways of doing the same thing in a single loop learning process. Practitioners are often so busy doing their day-to-day jobs, plus trying to implement *"new"* ways of doing things effectively which can be problematic (Jensen 2010b, Jensen 2011, Jensen and Youngs 2015), leaving little to no time for critical reflection on the underpinning philosophy of Command and Control, and to develop a critical double loop learning process (AFS Intercultural Programs 2015, Argyris 2002). Responding to disasters varies from other types of management, as *"on the job training is rarely an option since this might endanger lives" and "even shadowing can be a recipe for disaster because bad habits may develop from accumulated experience unless there is adequate feedback"* (Wilson and Gosiewska 2014) (p 633). This highlights the potential value a double loop learning process could bring to practice.

5.3.4 Terminology, Concept Uncertainty and Standardisation

Command and Control is built upon the premise that those organisations or individuals given responsibility to respond to disasters share a common understanding of the relevant terminology and concepts. Indeed, a significant amount of resources in terms of personnel, time and money have been devoted to projects such as the JESIP in the UK, which has trained approximately 10,000 Incident Commanders (Joint Emergency Services Interoperability Programme 2014). Though, JESIP has now ended, its legacy the Joint Organisational Learning arrangements are currently taking forward the principles of co-locate, communicate, co-ordinate, jointly understand risk and shared situational awareness (Joint Emergency Services Interoperability Programme 2015a, Joint Emergency Services Interoperability Programme 2015b). Similarly, in the US, NIMS compliance remains a key policy mandate intended to embed a consistent approach to emergency management at federal, state and local levels (U.S. Government 2003). However, the combined findings clearly demonstrate that a high level of terminology and concept uncertainty exists indicating that these programmes are not working as intended, which supports Jensen's (2009) (p 24) view that *"substantial variation still exists among emergency management programs, not just among regions or states, but also within regions and states":* a phenomenon that was also observed in the UK.

Both JESIP and NIMS aim to standardise emergency management, through the implementation of doctrine that embeds shared concepts, process and terminology: although, NIMS has a much broader remit that includes preparedness, communications, information

management, resource management, command and management (H.M. Government 2013c, U.S. Government 2003). However, the quotes in Fig 4.7 indicate that much work is still needed despite JESIP's assertion that *"with the Joint Doctrine UK emergency services interoperability is fit for purpose".* Concerns over differing language, terminology and interpretation of concepts were raised, which supports this conclusion. Furthermore, JESIP is limited to *"blue-light"* emergency services only so it excludes all other UK agencies and at the heart of the Joint Doctrine is the Joint Decision Model, which has been adopted as *"best practice"* (H.M. Government 2013h, Joint Emergency Services Interoperability Programme 2015c). However, the model was *"adopted"* from Police service doctrine by the other *"blue light"* services, much like GSB was in the mid-1980s (Adey and Anderson 2012, Hills 1994). So it may well only be a matter of time before the Joint Doctrine, including the Joint Decision Model, is rolled out via the Local Resilience Forum (LRF) mechanism to all other UK categorised emergency responders as Police Chief Constables hold the Chair positions at most LRF Executive Boards. Hopefully, this doctrine will be critically evaluated, refined and developed overtime, rather than be faithfully adopted. Efforts to standardise emergency management are considered to be the way forward, though Drabek (1985) and Jensen and Youngs (2015) argue potential for such outcomes may well be limited.

Interestingly, the standardisation theme was more of US concern, perhaps because compliance is linked to monetary grants. Hwever, levels of reported compliance as opposed to actual compliance and intent to comply vary between and within states further limiting potential for standardisation (Jensen 2009, Jensen 2010b, Jensen 2011, Jensen and Youngs 2015). These findings were somewhat contradictory in that participants expressed views that they believed standardisation was being achieved, and then raised issues under the Terminology and Concept Uncertainty theme, which suggested otherwise. It is possible that standardisation exists in some locations, a perception of it in others whereas in some areas limited to no standardisation may exist. However, the findings are inconclusive and more research particularly in the UK is needed to assess perceived and actual levels of standardisation.

5.3.5 Summary of Content Analysis Findings: Bringing Academia and Practice Closer Together

The findings demonstrated that interpretations of Command and Control are variable. Although the traditional frame was heavily favoured, understanding of key terminology and concepts was inconsistent, and a divergence between academic and practitioner knowledge exists. Summarily, this demonstrated that a closer exchange of expertise is necessity to drive both academia and a more importantly practise forward on account of the lives that may potentially be saved in the future. However, disaster research is not as integrated into practice as maybe it should or indeed could be as the field is still emerging and establishing itself as a formalised academic discipline (Neal 2014, Quarantelli 2005, Rubin 2009, Tierney 2007). Neal (2014) (p 3) cautions that *"our largest challenge for both the disaster science and emergency*

management is the anti-education/science strain that runs through our country (US) and parts of our profession now", highlighting a tendency within curriculum and textbook design that favours story-telling rather than theoretical advancement, and a view that combat or military experience is somehow preferable. This exacerbates Command and Control's hold on emergency management. P3 mentioned that they had a PhD in chemistry, but admitted that it was not listed on their employment record, and they actively hid it from colleagues. Furthermore, S3 pointed out that *"studying books"* seemingly a veiled reference to academia is not a top priority which highlights the significant challenge of engendering a more critical and deeper mind-set within practitioners:

- S3 (US): *"first-responders don't necessarily like to spend a lot of time studying books unless they have to"*

Herein, was an aspirational goal to bring academia and practice closer in a meaningful and synergistic way. This underpinned Objective 6, which sought to *"develop a suite of learning tools to enhance critical understanding of Command and Control".* The findings summarily demonstrated a *"real-world"* need to increase practitioners' criticality and knowledge of Command and Control on account of its limited critical visibility within the field maintained by a single loop learning process. Command and Control is firmly entrenched in policy and legislation so a critical understanding of the respective frameworks needs to be as high as achievably possible to ultimately reduce loss of life and suffering in future disasters. Cynically, one could simply advocate promoting the increasing number of academic programmes to enhance professional aptitude and develop the requisite critical knowledge (Neal 2014). However, building on the comments of S3 above, FR2, although referring to US Fire and Rescue recruitment highlights a pertinent issue:

- FR2 (US): *"there are a lot of regulations there's a national problem here in this country with recruitment and retention of people that want to volunteer in the Fire Service yes it's a big issue there's many organisation's trying to lobby for money to recruit and retain people that want to volunteer in a Fire Department because that's the bulk of this country's made-up with and because of federal requirements or state requirements that say you have to have this this this and this just to be able to drive a truck, go into a burning building it's a lot of hours and a lot of work"*

The most commonly cited theme was Terminology and Concept Uncertainty so a robust argument for investment in learning, development and training could be made. However, not all emergency management personnel whether a volunteer, part-time or a full-time will have the time, finances or the motivation to undertake academic study. Thus, any significant additions to Command and Control training in a standard academic format would add to the already significant burden. This could inhibit recruitment and retention although there would

be undoubted benefits from enhanced critical and theoretical knowledge achieved through higher education.

Drabek (2004) (p 7) stated *"the goal of constructing a general theory of emergency management should be a top priority within the disaster research community"* and it is under this aspirational mantle that the Contributions to Knowledge forwarded by this study are presented. As such, the Command and Control Interoperability Tool Box or CCIT Box offers a suite of learning tools that present novel contributions to both theory and practice that combine elements of linguistic and visual methodology. Bigley and Roberts (2001) (p 1290) point out that *"organizations possessing the greatest potential for reliability are those in which the most attention is given to developing, communicating, and connecting individual's understanding".* Accordingly, these tools were designed to develop greater shared and critical understanding of Command and Control, whilst at the same time complementing existing training methods in a synergistic manner without overwhelming them or adding significant burden, which would limit their potential usefulness in the field.

The following section reviews the linguistic and visual metaphor findings in the context of the relevant literature in order to establish the context and framework for the development of the CCIT-Box.

5.4 Discussion of the Metaphorical Analysis Findings

Metaphor is ingrained in natural language, it forms part of a communicative system used to express and convey in-depth meaning by mapping and transferring complex ideas from a source domain onto a target domain to make the unfamiliar become familiar (Cornelissen and Kafouros 2008a, Lakoff and Johnson 2003, Morgan 2007). This study harnessed this transformative ability within the emerging and relatively unexplored realm of disaster research. Metaphor analysis uncovered 525 linguistic metaphor types from approximately 300,000 total words and 30 transcripts (see Appendix 6 and 7). As the research design was qualitative and inductive the actual number uncovered was relatively unimportant because the significance of the findings is drawn from the application of the emergent metaphors to theoretical development and practice. Indeed, following the Herculean odyssey that was the verbatim transcription process the number of 525 *"felt"* small to the author as a result of the time and effort invested in producing the 30 transcripts and conducting the tri-sweep analysis process. That said, these linguistic findings contributed to the achievement of Objective 4, which sought to *"identify linguistic and visual metaphors of Command and Control used by UK and US emergency management practitioners"* so the total of 525 metaphors was an outright success from that perspective.

Patterns of metaphor usage in the transcripts were identified using 3 sources, namely, Morgan's (2007) metaphors, Lakoff, Espenson and Schwartz's (1991) Master Metaphor List, and a general linguistic metaphor category. Following data collation, the identified metaphors were assessed for significance. This was achieved through a process of triangulation, whereby a metaphor was deemed significant if it appeared in 3 transcripts from different organisations as this indicated that it had a degree of multi-agency relevance, thus potential to convey meaning between these organisations. The following section discusses the linguistic metaphor usage by considering the significance of the findings in relation to the literature and practice beginning with the shared metaphors, then those specific to the UK and US.

5.4.1 The Significance of the Induced Linguistic Metaphors

5.4.1.1 Shared Metaphors

The section below discusses the significance of the 5 shared metaphors detailed in section 4.4 of the findings chapter.

5.4.1.1.1 Status is Position

As shown in Fig 4.11, there were a number of variations of the Status is Position metaphor, although conceptually it was broadly understood. This framing is drawn from a traditional hierarchical interpretation of Command and Control (Anderson and Adey 2012, Schneider 1992). Cognitively the participants were shaping Command and Control along Weberian lines, reflected in their natural language, adopting a top-down perspective in which *"higher command"* was considered to be looking down upon the *"boots on the ground"* first-responders (Bigley and Roberts 2001, Waugh 2009c). The use of this metaphor indicates that despite the reported shift towards the professional model the base interpretation of the majority of the sample-frame (26 of 30) was still conceptually bounded within the traditional model (McEntire 2007, McEntire 2015, O'Leary and Blomgren-Bingham 2009). It is not that thinking cannot move beyond this frame: indeed, CG3 referred to ground up approaches, consider the quote below:

- CG3 (UK): *"I would take care to describe that pattern from the **ground up** some other the other services might define it from the **top down**"*

However, to borrow a navigational phrase, the practitioner's cognitive *Fixed Point of Origin* appears to be resolutely fixed upon traditional militaristic interpretations of Command and Control. Initial conceptualisation was based on this and it is to this frame that they generally returned, which restricts the likelihood of the professional model taking hold. Furthermore, the inherently hierarchical nature of this embedded cognitive frame causes a potentially more significant concern, which is directly linked to the aforementioned systemic faith. GSB and ICS/NIMS are based on the principle that the next level *"up"* will provide aid and should that

level be overwhelmed shore it up, and in most disasters this proves to be effective. This framing perpetuates the top-down viewpoint, as practitioners want to believe that help will always come as what's the alternative? The reviewed literature on *"catastrophes"* and hyper-complexity indicate that this may not always be the case. So it may be that the continued hold of Command and Control and reticence to move beyond it is because it acts as part of a psychosocial coping mechanism. If so, this presents a significant barrier to developing future disaster response methodologies.

5.4.1.1.2 Progress is Forward Motion

The use of this metaphor shown in Fig 4.12 is indicative of a general linguistic frame that moving forward is good and backwards or static is bad. When used to refer to emergency response it provides a status indicator of *"how things are going"*. However, it has limitations in that static or backwards in the context of a disaster may not necessarily be negative, consider CG2's comments below:

- CG2 (UK): *"Just understand the situation is understand what you've got to do and then just step back ten minutes isn't gonna make a difference certainly at my level erm you know the actions already starting to happen at local level and if you just **step back** it's fantastic so it's letting people get on with what they should do"*

CG2 indicates that the use of a short operational pause or *"step back"* can be fantastic in helping practitioners understand the situation at hand so in that sense it is entirely positive. Recognition of this metaphor within general conversation may heighten a practitioner's awareness of how colleagues view the progress being made as it provides a deeper insight beyond simple linguistic expression, adding to situational awareness.

5.4.1.1.3 Cooking

Cooking metaphors, shown in Fig 4.13, proved both thought provoking and insightful, consider P2's quote *"if it starts to bubble activate Silver"*, which actually contains 2 metaphors and if taken literally makes little sense. Disasters generally don't bubble, though a volcano or substance at a chemical plant might. In this context, the metaphorical use of bubble signals that the incident is becoming more serious and that loss of control as in boiling over is a risk. The second metaphor is Silver used to indicate UK tactical command. However, as noted earlier, GSB though a value-laden metaphor has become the generic brand for UK Command and Control. The power of this specific metaphor is that it provides richer depth in terms of meaning, as the receiver (the person being spoken to) is able to visualise the disaster bubbling out of control. Exactly how the individuals within the given conversation visualise the incident bubbling may differ but the *"symbolic shorthand"* of the metaphor conveys a deeper shared

understanding of the issue in a more efficient manner than *"if it gets worse activate Silver"* followed by a long-winded supporting narrative (Malinski 2009) (p 310).

5.4.1.1.4 Games and Play

The examples in Fig 4.14 illustrated the broad range of contexts in which the metaphor was verbalised. In the sporting sense P2 used the term *"scrum down"*. This is a rather aggressive phase of play in rugby used to restart the game where 8 members of a team bind together in 3 rows then close up with the opposition formation so that the heads of the front rows are interlocked, the ball is then inserted between the 2 teams who push the other back and forth for control and the middle players in the front row from each team, the hookers, try to gain control of the ball with their legs, all the while each team attempts to shunt the other backwards (World Rugby 2015). This phrase was used by P2 to metaphorically communicate a deeper meaning regarding the push and shove nature of agreeing multi-agency action during the initial stages of an incident; each organisations attempts to push the other back and forth whilst attempting to secure either primacy or favourable objectives.

Similarly, FR1 refers to *"people who don't wanna play in the sandbox"* this indicates that some partner organisations are viewed as behaving in a somewhat childish manner, which has implications for collaborative working and can potentially inform future interoperability strategy as it is suggestive of inter-personal concerns rather than broader organisational issues. Whilst this illustrates the power of metaphor, an advisory note of caution, as this is indicative, it can be used more effectively as part of a broader suite of analytical tools particularly if it is to inform policy development (Alvesson 1993, Cornelissen and Kafouros 2008a).

5.4.1.1.5 Conducting Research is Solving Problems

The examples outlined in Fig 4.15 illustrated that disasters are, to a certain extent, viewed as puzzles to be solved. The references to a metaphorical *"bigger picture"* allude to the search for greater situational awareness, which certainly in the early stages of a disaster is mired in rumour, counter-rumour, inaccuracies and false-hoods aligns with the disaster sociology literature on collective behaviour, so the metaphor of solving a puzzle is quite accurate (Dynes 1970, Quarantelli 2002, Schneider 1992).

Conceptually, this idea is linked to Games and Play though the Master List metaphors are more focused than the general category. Principally, the Games and Play metaphor is an extension of Lakoff, Espenson and Schwartz's (1991) work. In this case, its use is significant as it provides a deeper insight into how the participants see their collective role, that of piecing a puzzle together to resolve a disaster. This means that using related linguistic frames is likely to engender mutual understanding across organisations that used this metaphor.

5.4.1.2 Individual Metaphors – United Kingdom

The discussion below refers to the 6 individual metaphors located within either the UK or the US transcripts. For details see Figs 4.9 and 4.10.

5.4.1.2.1 Natural World

The quotes in Fig 4.16 provided a useful insight into the communicative power of this metaphor. CG1 talked about the missed learning opportunities post-exercise using the expression *"everyone breathes a sigh of relief and goes back into their rabbit holes, no one captures the learning so you start all over again".* The imagery of the rabbit hole vividly depicted a siloed organisational perspective, whereby once the exercise is completed they simply return to isolation rather than working together to draw out mutual learning. CG2 conveyed a similar meaning stating, *"it's gone back into its shell"* using the metaphorical imagery of an animal retreating back into its own shell to refer to organisations pulling back from multi-agency activity following austerity-related budget cuts to focus on internal matters. F2 used the process of ruffling and smoothing a bird's feathers to describe inter-personal and organisational relationships. Furthermore, A3 referred to *"feeding the beast at the top"* which is an extension of the Status is Position metaphor and a reflection of the hierarchical nature of Command and Control as the Commander, at the top, is seen as a beast that must be satiated through feeding (Adey and Anderson 2011, Lakoff, Espenson and Schwartz 1991, Schneider 1992).

5.4.1.2.2 Construction

Within the findings in Fig 4.17 CG1 employed the term *"a long screwdriver"* to articulate Cabinet Office Briefing Room (COBR) attempts to give direction to the local Gold commander, who as per legislation, policy and guidance holds the coordination role in a given incident alongside Strategic Coordinating Group (SCG) partners (H.M. Government 2004b, H.M. Government 2013a). The *"long screwdriver"* symbolises attempts to exert top-down authority associated with the dominant and traditional models, which actually contravene the primacy of UK local level decision-making (Dynes 1994, Hills 1994, McEntire 2015, O'Brien and Read 2005). These terms provided greater depth and understanding through the metaphorical traits that were transferred alongside the base linguistic meaning (Cornelissen and Kafouros 2008b, Lang 2008).

5.4.1.2.3 Acting On is Feeding

The quotes in Fig 4.18 are very similar in that feeding is used to articulate the process of information gathering and reporting to higher command. LG3 and F2 referred to *"feeding the beast"* similar to A3, which indicates the prevalence of the hierarchical and status-based frame, though in a natural world context. Furthermore, this notion of feeding the beast can also be

linked, albeit in an abstract manner, to Morgan's (2007) Organism metaphor as the cognitive and linguistic framing can be associated with hierarchical food-chains and natural orders, which are conceptually aligned lending credence to the argument that all we know about organisations is grounded in Morgan's 8 metaphors (Grant and Oswick 1996, Lang 2008, Morgan 2007).

5.4.1.2.4 Navigation

The first 2 quotes in Fig 4.19 by CG1 are driving related, in the first *"green light"*, a reference to traffic lights is used to signify waiting for authorisation from a higher level of command. In the second, CG1 uses the term *"not trying to read by road"* to indicate that they were adopting a broader perspective as when you are reading by road you are simply looking out of the vehicle window and navigating based on your immediate surroundings. You are not looking at what is further up ahead, in this sense the posture is reactive rather than proactive. Considering the evolution of disaster management from response only to a more holistic approach signified by the development of the Disaster Management Cycle (DMC) in the 1970s, this specific application has particular resonance and potential for application in the future as it promotes a more holistic forward-looking view (Coetzee and van Niekerk 2012, Lewis, Phillip and Westgate 1976). The quotes from LG1 and F1 use the phrases *"circumnavigate"* and *"on the right track"*. These linguistic frames employ metaphorical navigational traits to deepen the level of shared cognitive understanding. LG1's use of circumnavigate fosters images of emergency planners seeking out, exploring and opening up new information channels in a manner akin to Christopher Columbus discovering the New World or Captain Scott's Antarctic expeditions, rather than of breaking rules and protocols. Similarly, F1's use of *"on the right track"* is a metaphorical navigational reference used to indicate that the issue they are referring to (span of control) is generally correct.

5.4.1.2.5 The Mind is a Container for Objects

The quotes in Fig 4.20 reflect the core aspects of this metaphor, that knowledge was considered a physical commodity that can be transferred into and out of the mind. In this sense, it is a generalised linguistic metaphor rather than one with specific relevance to emergency management. That said, it offers a useful insight into how Incident Commanders perceive knowledge and its acquisition so it can be linked to theories of incident scale (Bissell 2013, Faulkner 2001, Fischer 2003, Quarantelli 2006, Rohn and Blackmore 2009, Wachtendorf, Brown and Holguin-Veras 2013). Thus, it can be used to illustrate Quarantelli's (2002) critique of the notion of a single commander as the amount, variety and complexity of information during disaster can often be overwhelming for one person necessitating teamwork, which also links to Lagadec's (2007) theory of hyper-complexity.

5.4.1.2.6 Clothing and Shopping

CG1 and A3 both used references to hats to indicate different roles or organisations, shown in Fig 4.21. CG2's statement *"one size doesn't fit all, they know what the other sizes are"* was a vague metaphorical reference to the GSB Command and Control framework, whereby the one-size-fits all cloths size is used in derogatory terms to suggests that the system doesn't fit all eventualities. F2 referred to being more in the shop window at Silver, meaning that in their view commanders at the Tactical Coordinating Group (TCG) are more visible.

5.4.1.1 Individual Metaphors – United States of America

The following section discusses the significance of the 2 individual metaphors found in the US data set.

5.4.1.1.1 Obstacles to Action are Obstacles to Motion

The quotes in Fig 4.22 indicate that participants equated action with motion and anything that prevented action-taking place was conceptualised as an obstacle to the smooth path of said motion. For example, S1 referred to a structural fire, which the Fire Department *"hit it with everything"* in order to establish a smooth path for action. Similarly, S2 made one of the few references to the recovery process and how *"it erm taxes those who are able rise to the occasion".* This expression and framing is multi-layered as the notion of lifting up and over a given problem also links to the Status is Position and Good is Up metaphors. This provides further evidence of the ingrained hierarchical and top-down framing that pervades cognitive processes, which reflects the legacy of the traditional model (McEntire 2015, O'Leary and Blomgren-Bingham 2009).

The quotes by E2 and E3 were further examples, E2 used the term push indicating that force is needed to ensure a smooth path for communications, whereas E3 identified what can be termed an immovable problem that was traversed around in order for the necessary action to take place. The linguistic phrasing here is significant as it can be used as a suggestive indicator of how the speaker views a particular issue or problem. If pressure or force exertion phraseology is used then it is believed that the problem can be influenced and overcome as in dealt with: note the inadvertent use of the Up is Good metaphor by the author. However, if the phrasing refers to going around or avoidance it is likely considered something that is not solvable at that time. Although, this linguistic *"tell"* is indicative of the person's frame of mind rather than conclusive.

5.4.1.1.2 Ideas are Constructed Objects

Similar to Mind is a Container noted in the UK findings, the examples in Fig 4.23 indicate that participants adopted a physical interpretation of cognitive processes. Ideas are viewed as tangible objects that can be moved from one place to another, and in the case of FE3 and S2's

views broken down and even thrown out the window. This perspective, that ideas are physical entities has mechanistic overtones further emphasising the influence of Morgan's metaphors, in this case Machine, have on our understanding of organisations (Morgan 2007). This is well recognised in the business and organisations literature and, the findings indicate that Morgan's theory also underpin aspects of linguistic metaphor expressions in emergency management (Grant and Oswick 1996, Lang 2008, Morgan 2007).

5.4.1.2 Usage of Morgan's Metaphor's in Spoken Language

This section discusses and analyses the triangulated findings of the linguistic usage of Morgan's metaphors outlined in Section B of Figs 4.9 and 4.10 respectively. The existence of a metaphorical language within the interview transcripts congruent with Morgan's (2007) organisational metaphors provides additional evidence of the theory's relevance within emergency management. This further supports the achievement of Objective 2, which sought to *"assess the relevance of Morgan's* (2007) *organisational metaphors within emergency management".*

5.4.1.2.1 Culture

Summarily, the culture related quotes in Fig 4.24, align with and build upon the Command and Control is Essential theme linking with participant's deep-rooted belief and faith in the hierarchical nature of the respective frameworks. LG2 points out that *"blue-light"* "*staff are brought up with it"*, P3 asserts *"it's part of our culture"* and F1 states, *"it's a way of life"* highlighting the in-doctrinal nature of Command and Control. S3 notes that it (effectiveness) starts with training and education, though the participant highlights a key cultural dynamic "*that I suspect that is important erm not everybody is attuned or works well in you know in a Command and Control situation some people aren't willing to subordinate"*. Furthermore, E3 in discussing the high level of expertise of the Forestry Service fire fighter used interesting and significant phraseology: *"he knows it, he preaches it, he does it"*. The use of the phrase *"he preaches it"* indicates a quasi-religious/spiritual interpretation, which supports and builds upon the systemic faith phenomenon noted earlier.

The findings indicate that the culture of Command and Control is heavily embedded in practice. However, no matter how dominant, essential or traditional a culture may be, it is a learned system of shared basic assumptions (Schein 2010). Therefore, if the limitations of the existing culture can be adequately demonstrated a new one can theoretically replace it, though this process is not easy as organisational change can take time and is often mired in significant difficulties (Alvesson 2002). The key point to note is that if Command and Control is primarily seen as a culture, then changes are likely to be accepted if a persuasive argument can be made.

5.4.1.2.2 Organism

The quotes in Fig 4.25 all centred on the same theme, that Command and Control is perceived to have living traits associated with Morgan's (2007) Organism metaphor. Command and Control was viewed as a living creature that exists within, reacts to and is influenced by its wider environment (Oates and Fitzgerald 2007). The respective frameworks were seen as living entities with the ability to evolve and adapt. This is an interesting perspective as it opposes the significant body of literature that criticises Command and Control for being too rigid, hierarchical and inflexible, which was discussed earlier. The existence of this metaphor within the findings adds further weight to the argument that a schism between academic knowledge and practitioner views exists.

5.4.1.2.3 Machine

The language used throughout the quotes in Fig 4.26 is mechanistic in tone as the words used can be readily associated with systems operation and maintenance. This indicates that participants were framing Command and Control as a machine with parts and components that can be added in and taken out (CG2, LG3 and S1), a start button (P2) and processes for evaluating systemic performance (FR3).

Though not the highest ranked in either the empirical or the qualitative analysis, these findings suggest that conceptually the metaphor was well understood. This indicates that the legacy of the traditional and dominant model, discussed earlier, which is associated with this metaphor, remains strong (McEntire 2015). This is likely a result of Command and Control's perceived essential nature; need to bring order to chaos and systemic faith that exerts a strong psychological hold. Conversely, the professional model can be more readily associated with the Organism, Political System and Flux and Transformation metaphors which were all noted in the linguistic findings indicating it is becoming more influential, though it has yet to completely dislodge the traditional model (McEntire 2015, O'Leary and Blomgren-Bingham 2009).

5.4.1.2.4 Political System

The quotes in Fig 4.27 illustrated the core themes of Morgan's (2007) Political System metaphor. Whereby, different actors are loosely networked within the Command and Control framework and though ostensibly guided by the goals of protecting life, property and the environment may also have other dissimilar competing objectives, which can influence and limit the effectiveness of the response operation (Lawley 2001, Oates and Fitzgerald 2007)

5.4.1.2.5 Flux and Transformation

The quotes in Fig 4.28 were centred on the themes of continuous change and indeed in the case of CG2's quote resistance to change. Given what we know from the literature about the uncertainties, inaccuracies, rumour and counter-rumour that occur in disaster, and the need for flexible, emergent behaviour at both the individual and organisational level (Britton 1988, Cornelissen and Kafouros 2008b, Drabek and McEntire 2002, Lindell 2011, Quarantelli 2002, Schneider 1992, Stallings and Quarantelli 1985, Stoddard 1968) this metaphor has potential for learning application. However, the element of chaos would need to be refined to alleviate issues associated with the order out of chaos myth to maximise the learning outcomes (McEntire 2015, O'Leary and Blomgren-Bingham 2009, Tierney, Bevc and Kuligowski 2006). That said, as the metaphor resonated with a small section of the UK sample-frame (CG, F and A), there may be potential to develop understanding amongst other organisations, though this would need research beyond the scope of this study.

5.4.1.3 Summary of the Linguistic Metaphor Discussion

Collectively this study identified the linguistic usage of 8 Master List and 6 general category metaphors, and 5 of Morgan's organisational metaphors within the 30 interview transcripts (Lakoff, Espenson and Schwartz 1991, Morgan 2007). As per the methodology, to be deemed significant these metaphors were triangulated across 3 organisations to ensure they had collective understanding in a multi-agency context. Similar to earlier findings, the linguistic patterns derived from spoken language indicated that there was not a single dominant frame or interpretation of Command and Control as the noted perceptions varied. However, the findings demonstrated the potential to develop a language within the English language based on metaphors of emergency management in order to increase shared understanding across organisations.

Barter (2011) (p 16) stated, *"organisations cannot be grasped like a physical object and thus our reliance on metaphors to make organisations compact, intelligible and understood"* is to be expected (Cornelissen and Kafouros 2008b). These findings establish the basis for a metaphorical language of emergency management as the terms outlined in Figs 5.2 and 5.3, which are derivatives of Figs 4.9 and 4.10, outline those linguistic metaphors that have demonstrable resonance and communicative power to practitioners. Though only early-stage in terms of theoretical development, the tables outline a framework for interoperability enhancement through metaphor-based linguistic training that can be used to support and enhance the CCIT-Box training tools. The tables provide basic linguistic metaphor awareness for practitioners that can be facilitated either as stand-alone training or integrated within existing activities, which is preferable on account of the innovative nature of the approach. At its most basic, the higher the metaphor appears on the list the more likely it is to be conversationally understood by practitioners. The user codes identify exactly which participants used which metaphor so strategies can be targeted. So theoretically practitioners can be coached to tailor their use of language to include phraseology and metaphor-based terminology to increase the

likelihood of developing a shared understanding to enhance interoperability when organisations are called upon to work together whenever disaster strikes.

The posited theory of interoperability metaphors is admittedly raw and it has limitations notably that the hierarchical ranking of the metaphors is purely indicative as a result of the qualitative inductive approach. However, the development of new theory often starts with baby steps that subsequently gain momentum through further research, the use of different philosophies, strategies and methods by the same or other academics to refine, advance and sometimes replace the new theory (Bechhofer and Paterson 2001, Bryman 2012, Gummesson 2000, Saunders, Lewis and Thornhill 2008). The potential herein is significant and with further research the acknowledged limitations can be overcome.

Figs 5.2 and 5.3 overleaf show the conversational metaphors, and are followed by discussion of the visual metaphor findings.

Fig 5-2: Linguistic Metaphors – United Kingdom				
Section A: Interoperability Metaphors				
Metaphor		**Source**	**User Codes**	**Count**
1.	Status is Position	Master List	CG1, CG2, CG3, LG2, LG3, P1, P2, P3, FE1, FE2, FE3, A1, A3	13
2.	Natural World	General	CG1, CG2, CG3, LG1, LG3, P3, F1, F2, A1, A2, A3	11
3.	Construction	General	CG1, CG2, CG3, P1, P2, P3, F1, F2, A1	9
4.	Acting is Feeding On	Master List	CG2, CG3, LG3, F1, F2, A1, A2, A3	8
	Games and Play	General	CG1, CG2, CG3, LG3, P2, F1, F2, A2	8
5.	Progress is Forward Motion	Master List	CG2, CG3, F1, F2, F3, A2	6
	Conducting Research is Solving a Puzzle	Master List	CG3, LG1, P2, P3, F1, A1	6
	Navigation	General	CG1, CG2, CG3, LG1, P1, F1	6
6.	Cooking	General	P2, P3, F1, F2, A3	5
	The Mind is a Container for Objects	Master List	CG1, P2, P3, F1, A1	5
7.	Clothing and Shopping	General	CG1, CG2, F2, A3	4
Section B: Command and Control Descriptor Metaphors				
Metaphor			**User Codes**	**Count**
1.	Culture		CG2, CG3, LG1, LG2, LG3, P1, P2, P3, F1, F2	10
2.	Organism		CG3, P3, F1, F3, A1, A3	6
3.	Machine		CG2, LG2, LG3, P1, P2, A2	6
4	Flux and Transformation		CG2, F3, A2	3

Fig 5-3: Linguistic Metaphors – United States of America				
Section A: Interoperability Metaphors				
Metaphor		**Source**	**User Codes**	**Count**
1.	Status is Position	Master List	FE1, FE2, S1, S2, S3, LE1, LE2, LE3, FR1, FR2, FR3, E1, E3	13
2.	Progress is Forward Motion	Master List	FE2, S1, S2, LE3, FR1, FR2, FR3	7
3.	Cooking	General	FE1, S3, LE2, LE3, FR1, E1,	6
	Obstacles to Action are Obstacles to Motion	Master List	FE3, S1, S2, FR3, E2, E3	6
4.	Ideas are Constructed Objects	Master List	FE2, FE3, S2, LE2, E3	5
5.	Games and Play	General	LE1, LE2, FR1, E3	4
	Good is up (Derivative of Status is Position)	Master List	S2, LE1, LE3, E3	4
	Conducting Research is Solving a Puzzle	Master List	FE3, S2, FR1, E2,	4
Section B: Command and Control Descriptor Metaphors				
Metaphor			**User Codes**	**Count**
1.	Culture		FE3, S2, S3, LE1, LE2, FR1, FR2, FR3, E1, E2, E3	11
2.	Political System		FE2, FE3, S2, LE2, LE3, FR1, FR3, E3	8
	Organism		FE1, S2, LE2, LE3, FR1, FR2, FR3, E2	8
3.	Machine		FE2, FE3, S1, FR3, E1, E2	6

5.4.2 Discussion of the Visual Metaphor Findings

The use of visual metaphor was an experimental method inspired by Schachtner's (2002) work on doctor–patient relationships which, gathered momentum following a partly tongue-in-cheek comment by the author during an early supervisory meeting. This led to further investigation of related approaches and a realisation of the increasing importance of visual methodology (Banks and Zeitlyn 2015, Rose 2001). The application of the method simply entailed asking participants to *"draw Command and Control"* during interview, which was occasionally met with quizzical looks particularly from senior UK *"blue-light"* service participants due to the relative novelty of the approach. However, the existing rapport ensured that any queries were easily overcome with an explanation and a little humour (Brewer 2005, Bryman 2012, Chrzanaowska 2002). Interestingly, the use of visual methodology produced findings that contrasted both the empirical and linguistic results. This demonstrated that the addition of visual methodology was a valuable one as the insights gained were beyond those afforded by linguistic inquiry alone.

5.4.2.1 Embedded Cognitive Framing: Status is Position

An initial visual scan of the UK images showed variable interpretations of Command and Control indicating an initial lack of commonality. Only 9 of 15 UK participants included the GSB framework, whereas the 13 of 15 US participants included some reference to ICS indicating a shared US frame based on this model. However, looking beyond the initial representation the search for deeper meaning uncovered a significant common trait. The most frequently used method of interpreting Command and Control was as an organigram, whereby the senior levels of command where placed higher up the image. This is a visual manifestation of Lakoff, Espenson and Schwartz's (1991) (p 59) Status is Position metaphor, which was observed in 27 of 30 images. This is a highly significant finding as it indicates that in most cases participant's cognitive visual processes framed Command and Control in a hierarchical manner, i.e. commanders at the top and first-responders at the bottom. Similar to the linguistic findings but differing from the empirical, this indicates that a core hierarchical interpretation of Command and Control also exists within the visual domain showing that despite the posited transition to the professional model (Kapucu 2008, O'Leary and Blomgren-Bingham 2009, Waugh and Streib 2006), the legacy of the traditional model remains firmly entrenched. This will likely continue to hinder the development of newer innovative and more collaborative approaches to emergency management (McEntire 2015). However, the discovery of the Organism, Brain and Political System metaphors, which are more aligned with collaborative approaches, indicate that the professional model has some traction (McEntire 2015, O'Leary and Blomgren-Bingham 2009).

5.4.2.2 Localised GSB/ICS Focus

Command and Control doctrine is split across numerous pieces of legislation, policy and guidance. GSB exists in the Civil Contingencies Act (2004b), various organisational policies and emergency plans; ICS also exists in various policy documents, state emergency plans and within NIMS (Department of Homeland Security 2008). Therefore, it is not unsurprisingly that practitioners do not frame Command and Control in a holistic manner. As previously noted, Drabek (1986) (p 88) identified this as a key issue. However, as the field was only transitioning from the response-centric 1970s era to the phased Disaster Management Cycle and the newly developed GSB and ICS frameworks this was perhaps understandable (Hills 1994, Jensen and Thompson 2015, Lewis, Phillip and Westgate 1976). That this issue remains some 30 years is not so easily forgivable. Only 3 of 15 UK and 1 of 15 US participants framed Command and Control on anything other than a local scale. It may be argued that the UK Cabinet Office Briefing Room (COBR), and the US state and federal systems are support mechanisms, which is entirely accurate. However, as only 4 of 30 participants included levels of command beyond the local is indicative of a lack of holistic understanding of both incident scale and the systemic complexities that can inhibit support to the local level. This in itself does not suggest that participants lack understanding of the higher-levels of command. Rather, it shows that when asked to think about then draw Command and Control there is a top-down, localised focus and anything above the local level is just not thought about. Whilst, the local level has primacy it is not the only level, and 26 of 30 visual metaphors indicate that cognitively it is framed as being so. The remainder of the national command frameworks (see Organigrams 1 and 2) were not cognitively linked within the minds of the participants, which limits the perception of systemic complexity.

A holistic perspective should include either the local and national levels in the UK or the local, state and federal levels in the US. Without this, the local level is framed in isolation, and the interconnectedness of the respective frameworks are not readily conceptualised. Though not formally part of the interview process, the author when mapping out the US national command structure (see Organigram 2) during the precursor visits to the US and the field-study asked local, municipal, country, state and federal practitioners about the whole Command and Control structure. The answer usually given was *"I'm not sure; I just make a phone call".* Indeed, it took over 3 years to build and validate Organigram 2 as each command level was very familiar with the structure at their own level and tended to have some familiarity with the level below i.e. state to county, federal to state, federal headquarters to federal region due to the nature of the top-down support mechanism. Similarly, in the UK most local responders had only a vague awareness of COBR and the national command structure evidenced by only 3 of 15 participants noting it as part of the Command and Control framework. This is further evidence of a fragmented and top-down understanding of Command and Control.

The purpose herein is not to argue that all practitioners should be experts in every level of Command and Control though greater knowledge would be beneficial, rather it is to highlight

the fragmented, top-down conceptualisation that occurred. Again, this is a legacy of the traditional model and its associated traits linked to the seemingly unshakeable faith in the system, and epitomised by the *"I just make a phone call"* quote. A holistic view of the overall framework would enable practitioners to more easily understand the intrinsic vulnerabilities of the current frameworks, appreciate problems caused by incident scale and complexity that are exacerbated by time and distance, and perhaps become more open to new and innovative approaches. The use of visual methodology enabled these issues to be more quickly uncovered through imagery as *"a picture is worth a thousand words",* which validated the selection of this approach (Barnard 2014).

5.4.2.3 Command and Control as a Brand

GSB and ICS have to a certain extent become brand names for applications of Command and Control philosophy. Interestingly, participants were asked to draw Command and Control not GSB or ICS so did not cognitively differentiate between the underpinning philosophy and the application of the said philosophy, which illustrates the extent to which the brands have become embedded. Thus, for 9 of the UK participants Command and Control is GSB and similarly for 13 of 15 US participants ICS is Command and Control. This is a significant and troubling finding, and to place this in context, it is a bit like saying English is language, which is not entirely true as it is a form of language. GSB and ICS are applications of Command and Control philosophy designed for local level operations. The UK and US Command and Control frameworks are much more complex: however the visual findings demonstrate that this is not readily conceptualised. Furthermore, brand-related psychological factors could hamper implementation of NIMS, which includes ICS, as it may well be perceived as the new brand of Command and Control as practitioners may be loyal to the previous brand (Department of Homeland Security 2008, Jensen 2009). However, this study does not provide enough data to conclusively support this view necessitating future research to make a fuller assessment.

5.4.2.4 Non-Integration of Recovery

Recovery is a complex and often long-term activity that can be extremely costly and politically sensitive. Indeed, sometimes complete recovery is not possible as the ensuing new-normality in post-disaster life means adaption is the only option (Kotler and Casoline 2009). The UK National Recovery Guidance (2013e) and the US National Disaster Recovery Framework (NDRF) (2011) are mooted as key policy documents, and the Disaster Management Cycle (DMC), with its clearly defined recovery phase, has been circulating both academia and practice since the late 1970s (Coetzee and van Niekerk 2012). However, despite recovery being a theoretically integrated element of the respective Command and Control frameworks, none of the participants included recovery in their diagrams. This indicates that cognitively it is thought of as separate; validating perspectives that recovery is an afterthought (Jensen et al. 2014,

Rubin 2009). This adds further weight for the development of a more holistic interpretation of Command and Control.

5.4.3 Summary of the Visual Metaphor Discussion

The visual findings provided an interesting foil to both the empirical and linguistic data sets. On the surface the visual imagery in the UK data set was varied, whereas the US images were more uniformed. However, the deeper insights afforded by the metaphorical analysis indicated a clear almost uniformed frame, namely Status is Position. Both the empirical and linguistic findings demonstrated a varied and fragmented interpretation of Command and Control, whereas the visual data painted a more uniformed and indeed narrower picture. These findings are the result of GSB and ICS indoctrination efforts. Indeed, Civil Contingencies Secretariat and Federal Emergency Management Agency representatives would likely view these outcomes as validation of their efforts at standardisation. However, the resultant locally framed, over-simplified and branded forms of Command and Control has left the field vulnerable as its true complexity and functionality is not readily understood or focused upon. It is too firmly entrenched and unquestioned to be properly critiqued, which is why this study was necessary.

5.5 The Command and Control Interoperability Tool Box (CCIT - Box)

The Command and Control Interoperability Tool Box or CCIT-Box is a suite of 8 tools that includes 2 interoperability assessment tools, 1 linguistic metaphor theory and 5 conceptual metaphors that can be employed collectively, individually or in any configuration required. This is a new framework proposed within this thesis, reflecting on the findings and different elements of the research process. The CCIT-Box was designed in a flexible manner so that each tool or grouping of tools can be slotted into existing training or learning environments to engender a more critical insight and deeper understanding of Command and Control. The conceptual metaphors were informed by the literature review; the base-frameworks emerged during the interviews and were shaped as the field study progressed. Section C in Figs 4.9 and 4.10 contain the range of induced metaphors that emerged, though not all were developed into learning tools.

The following metaphors drawn from the UK data set were considered then rejected due to limited development potential. The Precious Metals metaphor was used by 14 of 15 UK participants to refer to the UK Gold, Silver and Bronze (GSB) framework. Although, the expression is metaphorical as the levels of command are value-laden relative to the metal's worth, the term is used in a generic manner akin to the way Dyson and Hoover is used to refer to a vacuum cleaner limiting the potential and value of any learning tool (Arbuthnot 2008, Flin and Arbuthnot 2002, Lincoln and Thomassen 2009). Similarly, the Herding Cats metaphor whereby multi-agency partners are likened to feral cats as they are seen as being difficult if

neigh on impossible to direct, and the Banging your Head against the Wall metaphor, which expresses frustration with multi-agency decision making processes and internal managerial interference with operations were not developed due to foreseeable negative connotations and limited theoretical potential. However, as discussion points to support learning about Command and Control these verbal metaphors have application. However, their usage would need to be gauged to the audience, applied with sensitivity and most likely a fair dose of appropriate humour. Should this be applied then, these verbal metaphors can help convey a deeper understanding of the frustrations that can occur when conducting multi-agency operations within a Command and Control framework. In that sense, they constitute informal additions to the CCIT-Box.

The 2 interoperability assessment tools were developed from the empirical and visual methods used to assess the relevance of Morgan's (2007) organisational metaphors and to capture images of Command and Control based on the work of Schachtner (2002). These were refined based on the experience gained within the field study and adapted for theoretical development purposes. The theory of interoperability metaphors uses linguistic metaphors in spoken language as tools for multi-agency interoperability enhancement. The 5 conceptual metaphors presented address limitations and issues associated with Command and Control. They combine visual imagery and supporting narratives to link theory and practice using innovative but simple to use tools that are accessible at different levels of complexity to nudge the learner towards a double loop learning process (Argyris 2002). The application of the metaphors can be via group-based discussion, which can be large or small, single or multi-agency. The group can be as small as 2, though the method is much better suited as a discussion rather than a 1-way briefing. However, there is potential to develop the CCIT-Box using online or App based technologies, which is discussed later.

The design concept uses rich visual imagery coupled with a thought provoking narrative to convey and embed critical theoretical principles and greater knowledge within the community. The depth of theoretical content and discussion can be tailored to the level and specific needs of the audience. For example, volunteer fire fighters may not require the same level of input as a class of Master's students. However, the fundamental principles conveyed by the conceptual metaphors remain and can be taught in a condensed and truncated manner as necessary. Please note: it is not necessary for the students to agree with the narratives: indeed, opposing views within a group is beneficial to the learning experience. The mere fact a student listens to and considers the issues heightens their awareness so whether or not they agree with them is actually a secondary concern. So, at this stage of theoretical development the CCIT-Box is primarily intended for awareness building. The following section presents the 2 interoperability assessment tools, 1 linguistic metaphor theory and the 5 conceptual metaphors outlined below:

Interoperability Assessment Tools

1. Interoperability Metaphor Analysis (IMA)
2. Visual Interoperability Analysis (VIA)

Linguistic Metaphor Theory

1. Theory of Interoperability Metaphors (TIM)

Conceptual Metaphors

1. A Candle: the limitations of the model
2. A Trivial Pursuit Pie: barriers to interoperability
3. The Golden Thread: the Spine of Command and Control
4. Spinning Plates: Maintaining Span of Control
5. Virus/Antidote: An Alternative Perspective?

5.5.1 Interoperability Analysis Tools

5.5.1.1 Interoperability Metaphor Analysis (IMA)

Interoperability Metaphor Analysis (IMA) was intended as a simple tool to assess perceptual variations of Command and Control. The posited method is an advancement of the approach trialled within the field study. Its design is based on the application of Morgan's 8 metaphors and is best applied during the early stages of a relevant Command and Control training session. The ranking template can be distributed for completion as it only takes a few moments. Once this is done, the data can then be analysed, whilst the training continues, though this will require a second person, and the results given at a time of the facilitators choosing. The idea behind the approach is built upon a point raised by A1 who stated, *"you know that we all understand what Command and Control is".* However, individuals and organisations often interpret things in different ways. IMA simply provides a mechanism to demonstrate to practitioners that they may all know what Command and Control is and believe that they are *"on the same page"*, but they actually see it in different ways. IMA engenders a heightened awareness of perceptual variability so, for example, a Police officer will be more likely to understand that a Fire fighter or local government official may not always see things as he or she does. The benefit of using IMA is that it promotes this awareness, which can potentially enhance levels of interoperability.

Fig 5.4 below, which is an adaptation of Fig 4.3, contains the metaphor ranking scores, which have been converted into pie charts to illustrate the perceptual variability for the UK and US data sets. At the time of writing, the IMA method was being digitised so that the metaphors can be applied via an online Moodle quiz and the charts produce electronically in a matter of moments, which will increase the effectiveness of the method's application.

Fig 5-4: IMA - Metaphor Ranking Scores			Scores		
Metaphor	**UK ORGS**	**US ORGS**	**UK**	**US**	**T**
Machine (M)	CG, LG, P, F, A	S, LE, FR, E	65	84	149
Organism (O)	CG, P, F, A	S, LE, FR, E	45	34	79
Brain (B)	CG, P, F, A	FE, S, LE, FR, E	84	**90**	**174**
Culture (C)	CG, LG, P, F, A	FE, S, LE, FR, E	**88**	78	166
Political System (PS)	CG, LG, P, A	FE, S, LE, FR, E	23	54	77
Psychic Prison (PP)	CG, LG, A	S, LE, E	12	17	29
Flux & Transformation (FT)	CG, F, A	S, LE, FR	38	30	68
Instrument of Domination (ID)	LG	LE, FR	8	5	13
None of the Above (NA)	LG, P	FE	20	10	30
TOTAL (T)			383	402	785

Fig 5-5: UK Interoperability Metaphor Analysis Chart

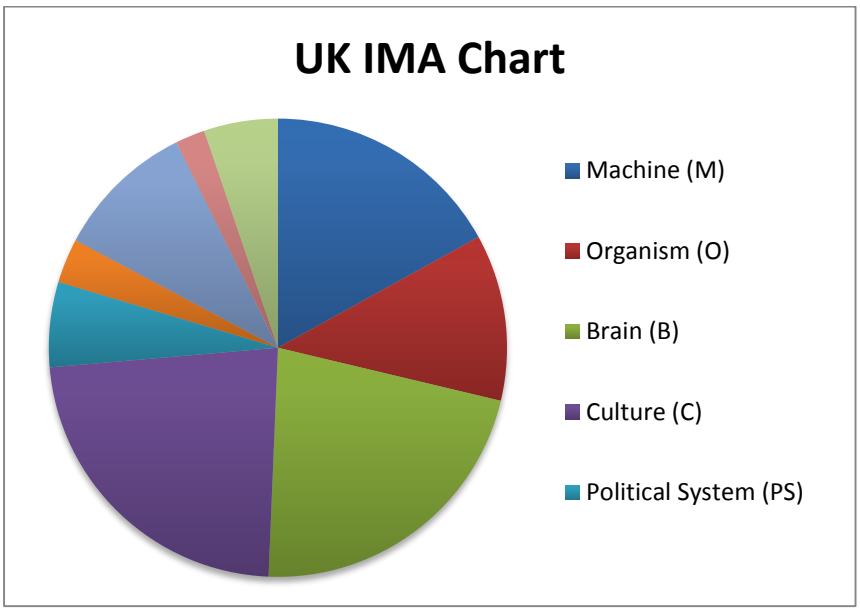
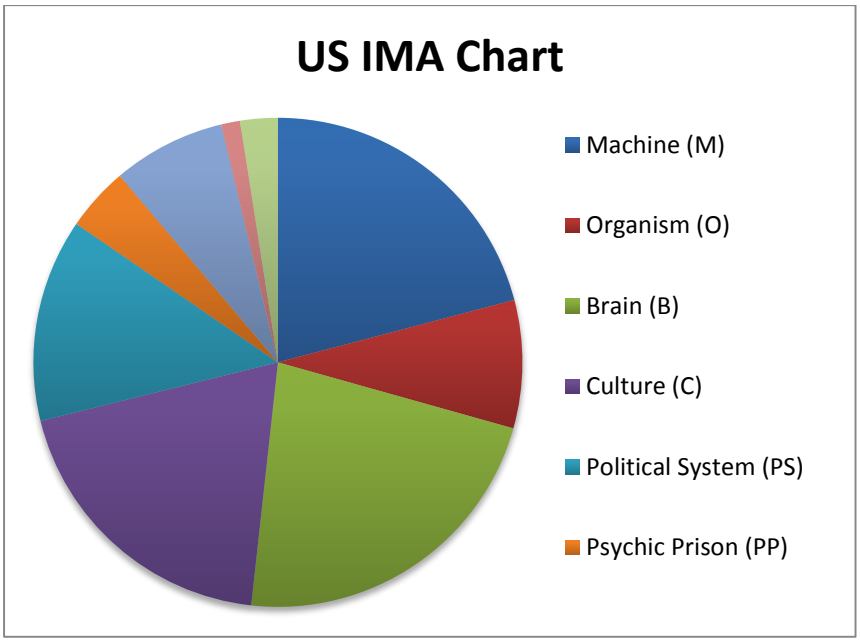


Fig 5-6: US Interoperability Metaphor Analysis Chart



The diagrams can be tailored to suit particular needs, the pie charts above are anonymous but they could include user-codes or percentages if necessary. This information was omitted because it was not required to illustrate the key learning point: that individual practitioners and key organisations interpret Command and Control in different ways. Thus, greater awareness, through IMA, and other efforts to understand and communicate these differences are much needed.

5.5.1.2 Visual Interoperability Analysis (VIA)

Building on the use of visual metaphor within this study, Visual Interoperability Analysis (VIA) has demonstrable potential as both an individual and group-based learning tool, and also as a practitioner analysis tool.

5.5.1.2.1 Individual Application

At an individual level asking practitioner's to draw Command and Control provides a unique insight into their personal interpretations. This can be harnessed as a learning tool by simply asking a group of trainees to follow the same process then comparing and contrasting the images produced. The facilitator then draws out the key learning points by focusing on the similarities, differences and relevant metaphors to highlight how the issues raised could impact *"real world"* operations. The images can also be compared to the policy frameworks for the respective countries to confirm knowledge.

5.5.1.2.2 Group-Based Application

Similar to above, a group-based activity would afford learning benefits. Please note: this activity would be established within a social constructivist rather than the interpretivist paradigm adopted within this study (Brooksbank 2013, Bryman 2012). However, as this is an outcome rather than a research activity this is defensible. The task again centres on drawing an image of Command and Control, but this time it is completed by small groups, and depending on demographics these should be as mixed as possible (i.e. not separate Police, Fire and Ambulance). Whilst, this type of activity is not unusual or indeed novel in a training environment, each group would be required to discuss different views on Command and Control and agree a common interpretation, which heightens awareness of perceptual differences through dialogue. Again, the facilitator then draws out appropriate learning points as necessary through comparison and contrast. The risk with this approach is that participants simply draw a GSB or ICS framework negating wider learning; although, proactive facilitation will negate this. Consequently, this method is best used alongside the conceptual metaphors, ideally after these have been administered as they promote a more critical mind-set. However, this is an acknowledgeable limitation of the approach.

5.5.1.2.3 Practitioner Application

Though not in keeping with the spirit of the research or the author's ideals, the overwhelming predominance of the ICS framework in the US visual data set highlighted the potential for visual metaphor to be employed as a knowledge-checking tool for practitioner's knowledge of GSB/ICS.

5.5.2 Linguistic Metaphor Theory

5.5.2.1.1 A Theory of Interoperability Metaphors (TIM)

A core element of this study was capturing the natural language that UK and US practitioners used to express and convey their understanding of Command and Control, and indeed wider emergency management issues. This study collated over 500 different metaphor-types across the 30 transcripts. These were identified using Morgan's (2007) and Lakoff, Espenson and Schwartz (1991) metaphor theories, and using Steen's (2007) Metaphor Identification Process (MIP). The findings (see Fig 5.2 and 5.3) demonstrated clear patterns of metaphor usage, although some trends were shared whereas others where geographically specific. These findings established the basis of a metaphorical language of emergency management dubbed the Theory of Interoperability Metaphors (TIM). The theory posits that the linguistic metaphors detailed in Fig 5.7 have meaning across multiple organisations, thus can be utilised to engender interoperability through their usage in multi-agency environments. The theoretical framework, outlined within Fig 5.7, lists the metaphors with contextual examples, the organisations with which they resonate and a count of the number of transcripts in which they appeared. This, coupled with the range of User Codes gives a relative indication of the likelihood of the metaphor being understood and of conveying a deeper more interoperable meaning which, can be readily picked up and used by academics and practitioners alike to enhance communicative effectiveness in respects of emergency management. Thus, opening up a new theoretical domain with exciting practical and *"blue-sky"* research applications, which can address a known *"real-world"* issue.

Fig 5-7: Theory of Interoperability Metaphors (TIM)				
Shared Interoperability Metaphors				
Metaphor		**Example**	**User Codes**	**Count**
1.	Status is Position	*"The PM (Prime Minister) to the PC (Police Constable)* ***the very very top to the very very bottom*** *of the span"*	CG, LG, P, F, A, FE, S, LE, FR, E	26
2.	Culture	*"Rather than a standard definition erm it's a* ***way of life*** *for us erm it's trained in for every fire fighter you know the minute they start training"*	CG, LG, P, F, FE, S, LE, FR, E	21

3.	Organism	*"The incident command system itself is being developed all the time so it's **evolving**"*	CG, P, F, A, FE, S, LE, FR, E	14
4.	Progress is Forwards Motion	*"It was trying to **catch up** in terms of what their responsibilities was who they were answerable to and how it was supposed to go **forward**"*	CG, F, A, FE, SE, LE, FR	13
5.	Games & Play	*"Interoperability has been described in NATO as a state of mind you can give people the **train set** but unless they are prepared to **play nicely together** with it then there's really no point"*	CG, LG, P, F, A, LE, FR, E	12
6.	Machine	*"There needs to be understanding of when certain **parts** of Command and Control are used and utilised so when you **operate** them when you **bang** them in you em **start then up**"*	CG, LG, P, A, FE, S, FR, E	12
7.	Cooking	*"If it starts to **bubble** activate silver"*	P, F, A, FE, S, LE, F	11
8.	Conducting Research is Solving a Problem	*"The individual organisation **fits in with the big picture**"*	CG, LG, P, F, A, FE,S, FR, E	10
Interoperability Metaphors – United Kingdom				
1.	Natural World	*"I think it's actually gone back **into its shell** I think because we've had austerity people have lost erm the use of erm the have lost their their erm their whole sphere of what can go into an LRF and you see less and less voluntary sector involvement"*	CG, P, F, A	11
2.	Construction	*"Under the previous administration there was I think… how did they describe it a **long screwdriver** where I can't say exactly which incidents where COBR would… by trying to give direction to the local gold commander when it wasn't a national it wasn't a significant (emergency)"*	CG, LG, F, A	9

3.	Acting On is Feeding	*"Most of the time you end up **feeding** the beast literally getting the SITREP together rather than actually doing what you need to be doing a lot of the time so it's kind of juggling your priorities"*	CG, LG, P, F, A	8
4.	Navigation	*"My boss spent 15 minutes waiting to come back to me gave me the **green light**"*	CG, LG, P, F	6
5.	The Mind is a Container for Objects	*"There are only so many things that you can **fit into 1 human head** (complexity of response operations"*	CG, P, F, A	5
6.	Clothes and Shopping	*"It works very effectively where you have a very strong gold commander and that might be a gold commander who's got a police **hat** on or occasionally where you've had a health **hat** or also erm a fire lead"*	CG, F, A	4
7.	Flux and Transformation	*"They're developing all the time, there's so many **new** initiatives and **new** ideas coming to the fore"*	CG, F, A	4
Interoperability Metaphors – United States of America				
1.	Political System	*"You had the mayor trying to dictate emergency management that doesn't work we're professionals we do it for a living we plan for this we exercise for this let us do our job the Mayor of XXXXXX did not do that"*	FE, S, LE, FR, E	8
2.	Obstacles to Action are Obstacles to Motion	*"When our fire departments go to a structure fire for example they know they've got to make sure that first people are out of the building and secondly they are gonna **hit** it with everything you know"*	FE, S, FR, E	6
3.	Ideas are Constructed from Objects	*"I can **break it down** to what I think is the most fundamental Tony the ability erm to provide leadership during the mission"*	FE, LE, E	5
LEGEND: CG = Central Government, LG = Local Government, P = Police, F = Fire, A = Ambulance, FE = FEMA, SE: State Emergency Management, LE = Law Enforcement, FR = Fire and Rescue, E = Emergency Medical Services				

5.5.3 Conceptual Metaphors

5.5.3.1 The Candle – The Limitations of Command and Control

Fig 5-8: The Candle Metaphor

- Image source: (Christ 2012)

The Candle metaphor is the most theoretically detailed of the conceptual metaphors, and is designed to illustrate the limitations of Command and Control when faced with increasing scales of incident. This reflects a greater recognition that *"emergencies"* and *"disasters"* are not the same, and that *"catastrophes"* are fundamentally different being hyper-complex entities requiring new and innovative approaches over and above it's a big incident let's make Command and Control bigger (Bissell 2013, Lagadec 2007, Quarantelli 2006, Wachtendorf, Brown and Holguin-Veras 2013). The narrative begins with the premise that Command and Control is a limited concept based on McAleavy's (2010) framework, which defines 4 areas of vulnerability. These are specialist personnel, access and egress, communications and the ability of Command and Control to integrate convergent and emergent resources. Command and Control, irrespective of the country, has a track record of successes and of failures. Global trends in disasters such as Hurricane Katrina (Waugh 2006) and the Tohoku earthquake and tsunami (Kurokawa 2012), and others have demonstrated time and again that as the scale grows increasingly unsustainable systemic demands are made (McAleavy 2010, Quarantelli 2006, Wachtendorf, Brown and Holguin-Veras 2013). These demands ultimately render Command and Control based frameworks ineffective during the most severe disasters, as will be demonstrated.

5.5.3.1.1 Vulnerability 1: Specialist Personnel

Specialist personnel are the foundations of Command and Control as they form the hub of the emergency response social network (Wasserman and Faust 1994). The frameworks detailed in Organigrams 1 and 2 require increasing numbers of frontline personnel, incident commanders, support staff, technicians, logisticians, sub-national/state and, national/federal personnel to sustain operations (McAleavy 2010). As the disaster grows from a local to a national issue in the UK, or a local to state, to a multiple state issue up to a federal concern in the US the requirement for specialist personnel rises exponentially as there is an intrinsic assumption that personnel will be available. However, as the scale increases from *"disaster"* to *"catastrophe"* this becomes less sustainable, so as the demand increases the supply reduces as personnel may well be dead or injured or simply unable to undertake their normal role because of the devastation (Quarantelli 2006).

5.5.3.1.2 Vulnerability 2: Access and Egress

Command and Control assumes a degree of access and egress to key sites; the afflicted areas, command centres, logistics sites and communications hubs (McAleavy 2010). Whilst, the US public maybe told to be prepared to be on your own for up to 72 hours practitioners expect to be up and running almost immediately (Federal Emergency Management Agency 2007). However, international experience together with knowledge of incident scale, time, distance and hyper-complexity all indicate that mobility in disaster is at a premium as the infrastructure it requires is often severely damaged or totally destroyed (Bissell 2013, Faulkner 2001, Fischer 2003, Gomez et al. 2007, Jensen 2009, Lagadec 2007, Quarantelli 2006, Rohn and Blackmore 2009, Wachtendorf, Brown and Holguin-Veras 2013). Thus, as Command and Control's systemic need for greater access and egress increase the sustainability of the infrastructure mobility requires is compromised reducing effectiveness.

5.5.3.1.3 Vulnerability 3: Communications

In most disasters and indeed following many exercises communications are cited as a key failing so there are numerous programmes designed to promote communications resilience (McAleavy 2010, Pollock 2013). These are critical as Quarantelli (2006) (p 1) points out that in disaster *"organizations have to quickly relate to far more and unfamiliar converging entities".* Thus, Command and Control is designed to be flexible, though this inevitably exerts pressure on communications networks. This is exacerbated if specialist personnel are unavailable or are unable to get to the communications hubs where they are needed. Furthermore, during *"catastrophes"* Quarantelli (2006) (p 1) states, *"most, if not all, of the everyday community functions are sharply and concurrently interrupted"* meaning that when communications are most required, and Command and Control needs to be scaled-up, the networks required to

implement and maintain operations are likely to be inoperable or severely degraded. Again as demand goes up supply goes down limiting or rendering Command and Control ineffectual.

5.5.3.1.4 Vulnerability 4: Emergent and Convergent Resources

Command and Control is a social network and when disaster strikes logistics mechanisms often struggle to cope with emergent behaviour and the massive influx of convergent resources (Gyongyi and Spens 2009, Holguin-Veras et al. 2007, Houghton et al. 2006, McAleavy 2010, Wasserman and Faust 1994). Emergent and non-planned activities are often deemed anti-social and in contravention of the formal response (McEntire 2007, McEntire 2015, Schneider 1992). Indeed, the UK's professionalised model is only accessible to categorised emergency responders (H.M. Government 2004c). However, Dynes (2000b) (p 2) points out, *"throughout history, most disasters and their consequences had to be handled by pooling the resources of extended families, kin groups and neighbours".* Emergent behaviour is normal and actually predates existing approaches; it still occurs today and in the developing world where formalised Command and Control is not in place it is the only method of disaster response. Furthermore, Stallings and Quarantelli (1985) (p 98) argue, *"emergence is inevitable, before during and after disasters"*. So this phenomenon is to be expected as it is natural and inevitable, it is not chaos though it may well look chaotic, and it cannot be eradicated through planning (Stallings and Quarantelli 1985).

Command and Control can restrict emergent behaviour due to the continued legacy of the traditional model and a preference for formality (McEntire 2015). Emergent resources frequently experience difficulties in working alongside formal organisations though, initial reticence is often followed by a realisation that there is no other option so the responders adapt to the situation and work pro-socially (Barton 1969, Britton 1988, Drabek 1986, Drabek and McEntire 2002, Dynes 1970, Fischer 2003, Kreps 1984, Kreps 1989, Quarantelli and Dynes 1977, Quarantelli 1978, Rodriguez, Trainor and Quarantelli 2006, Stallings and Quarantelli 1985). In these instances however, it is not Command and Control that adapts it is the responders so GSB or ICS/NIMS can actually inhibit this process if *red tape* is followed too precisely, leading to a phenomenon known as *"going down by the book"* and failure (Tierney 2001).

In addition to problems with emergent resources, Command and Control also struggles to manage convergent resources (Destro and Holguin-Veras 2011, McAleavy 2010). *"Catastrophe"* is usually followed by an influx of much needed resources, which can be delayed or halted by the scale, scope and complexity of the event. The responses to Hurricane Katrina, the Haitian earthquake, the Tohoku earthquake and tsunami and Typhoon Haiyan stand as a testament to this. Command and Control philosophy is based on numerous false assumptions that resources in the 4 outlined domains, along with others, can and will be sourced from somewhere, as the disaster gets bigger the respective frameworks are simply enlarged without

understanding of the significant complexities and systemic vulnerabilities that this brings (Dynes 1994, Lagadec 2007, McAleavy 2010, Schneider 1992). McAleavy (2010) (p 53) stated, *"limitations without understanding are a recipe for disaster"* arguing a need for a greater systemic understanding of what Command and Control can and cannot achieve.

5.5.3.1.5 Command and Control is a Candle

Command and Control has its uses though it does not know the limits of its own systemic effectiveness (Bigley and Roberts 2001, Cole 2000, Jensen and Waugh 2014, Jensen and Thompson 2015, Waugh 2009a). However, the 4 systemic vulnerabilities are a start (McAleavy 2010). The supporting metaphorical narrative likens Command and Control to using candles to provide light; as a technology it works. If you want to read a book a candle can light your study and if you need more light you can get a bigger candle. If your upstairs landing is dark, you can get a bigger candle and it will give you more light. If perhaps, you need to light your backyard, you could make an even bigger candle, as it will provide you with a greater amount of light. If the street is dark you could make a 2-storey tall candle to light up the neighbourhood or even a skyscraper sized one to light up a city. Obviously, though logical this is somewhat nonsensical, as candles provide only a set amount of amount of light, as it is a limited technology. When a significantly greater amount is needed we look to other approaches, at technologies such as gas and oil lamps or electricity. However, with disasters Command and Control is the candle as we simply make it bigger and bigger and bigger until it fails, as there are no other options. Beyond a small cadre of researchers there is limited work on mapping systemic limitations of Command and Control or looking at alternative methodologies so we are stuck in a single loop learning process (Argyris 2002).

The Candle metaphor promotes a more critical perspective by opening up the mind's inner eye. Indeed, Bissell (2013) (p 6) argues, *"no single command and system will be effective in bringing all needed resources to bear on a response"*, suggesting that a decentralised multiple candle (i.e. framework) approach may well be the future of catastrophic response.

5.5.3.2 The Trivial Pursuit Pie – Barriers to Interoperability

Fig 5-9: The Trivial Pursuit Pie Metaphor

- Image source: (Cortez 2014)

The Trivial Pursuit Pie metaphor is based on the game piece from the award winning board game originally developed in Canada in 1979 (Hasbro 2015). Its purpose is to highlight what can be termed the *"interoperability problem"*. As discussed previously, a Command and Control framework is a social network that draws together increasingly more organisations as the scale of disaster increases (Magsino 2009, Quarantelli 2006). For the response to be effective, personnel are (ideally) required to collaborate which led to the rise of the professional model (Kapucu 2008, McEntire 2015, O'Leary and Blomgren-Bingham 2009, Waugh and Streib 2006, Waugh 2009c). However, organisations and individuals bring with them different cultures, sub-cultures, identities, personalities, norms and values and goals, which are not necessarily complementary (Alvesson 2002, Bigley and Roberts 2001, Cote and Levine 2002, Schein 1994).

The Trivial Pursuit Pie visualises how these issues can inhibit the development of multi-agency interoperability. The individual wedges represent an organisation, its culture, subcultures, identities, personalities, norms and values, agency specific legislation, plans, policies, standard operating procedures and tactics; formal ways of doing things and the ways things are done

around here. The game piece or pie represents the emergency management legislation, policy, guidance and practice, and the Command and Control framework, which bring together all relevant organisations. On face value, the organisations are linked together in regimented fashioned and if you were to place the disaster at the centre of the pie where the inner tips of the wedges converge then the image is an almost perfect metaphor for how Command and Control is supposed to work. The organisations surround the disaster, contain it and collectively resolve it. However, if you look more closely, despite the transparent game piece (Command and Control), the organisations are siloed. Though, closely aligned and tightly packed they are self-contained within their own individual domains. These barriers exist in organisationally specific cultures, identities, policies and procedures. This ultimately restricts interoperability and limits what can be achieved with current approaches.

Logic would advocate developing a single culture, identity and way of doing things: however in reality the likelihood of achieving standardisation on such a wide spectrum is likely impossible (Drabek 1985, Jensen and Youngs 2015). Rather, what is needed is greater understanding of the limitations of existing approaches and a collective willingness to develop alternative and complementary approaches. Indeed, Helsloot (2008a, 2008b) argues that efficiency in multi-agency emergency response is more likely to be achieved in working together alone, a radically different ethos than the current view.

5.5.3.3 The Golden Thread – The Spine of Command and Control

Fig 5-10: The Golden Thread Metaphor

- Image source: (Wilde 2005)

The Golden Thread metaphor is based on comments made by F1, who used it to describe the interlinked nature of the levels of Command and Control, which need to be protected as if they are separated or cut the system fails. The metaphor conveys significant meaning and is likely influenced by Greek and Roman mythology, and traces of Hinduism. The Greek *Moirai* or fates strung out a thread of destiny when a person was born, and cut it when they died (Atsma 2015). Hinduism also contains an idea of a golden thread linked to a person's soul and the concept of rebirth (Acharya 2002) (p 7). The interpretation of Command and Control as a Golden Thread that needs to be protected has organismic traits, and is useful in highlighting the increasing systemic vulnerabilities that occur as the disaster gets bigger (Morgan 2007). Simply put, the longer you stretch the Golden Thread the more vulnerable to snagging, fraying and breakages it becomes which, resonates with trying to maintain effective Command and Control over increasing distances.

Additionally, the metaphor can be used to address a critical issue for which there is arguably no correct answer. When the thread begins to break do you turn inwards to protect the thread (shore up Command and Control) or outwards to deal with disaster victims? This highlights the power of metaphor in engendering deeper insights and reflection. Although, they do not provide the answers they offer a useful mechanism to start addressing some of the complex issues which need to be addressed if we are to more effectively meet the needs of future *"disasters"* and *"catastrophes".*

5.5.3.4 Spinning Plates – Task Saturation and Span of Control

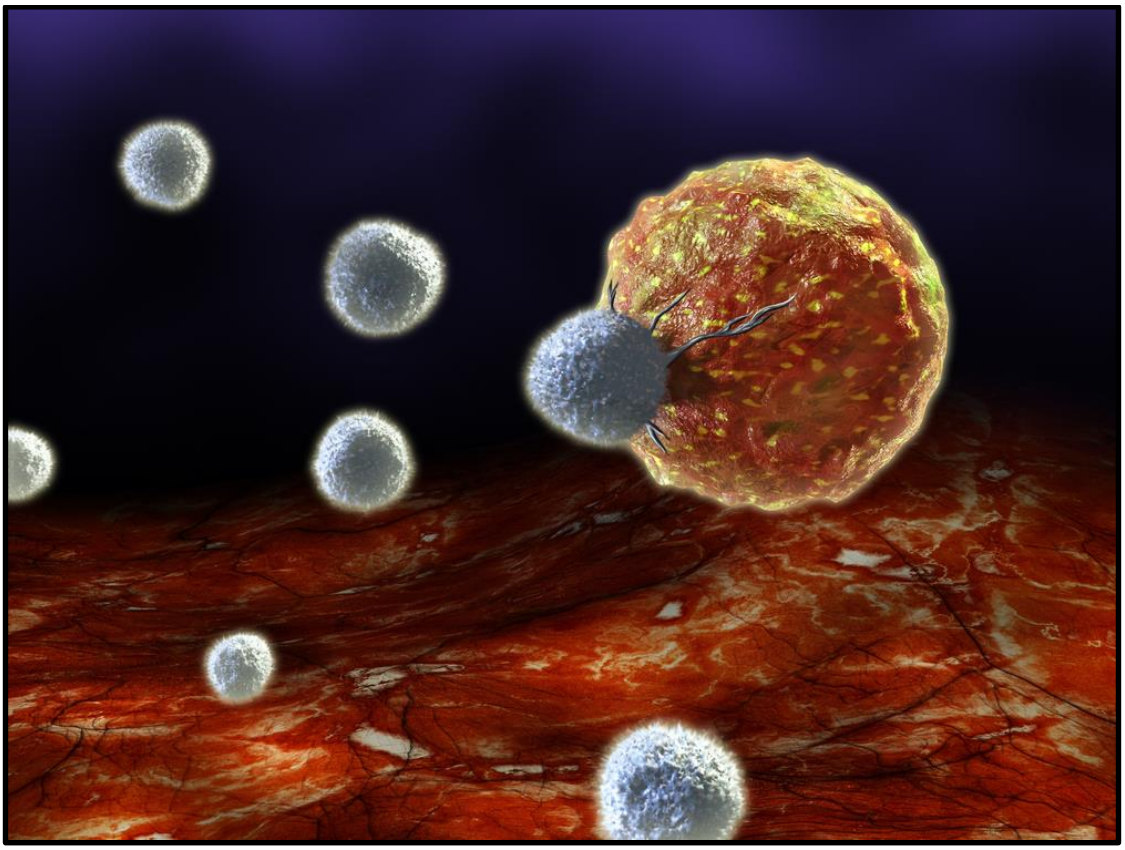
Fig 5-11: The Spinning Plates Metaphor

- Image source: (Bosworth 2011)

The Spinning Plates metaphor is rather simplistic. It was used by CG2, CG3 and P3 to describe the process of managing the various command tasks. These are viewed as plates that must be continuously spun and balanced, and was primarily applied in a tactical and operational context. The meaning it conveys is that if too many plates (tasks) are taken on then they start fall and break, which symbolises ineffective command and task delegation. Similarly, the metaphor can also be used to illustrate Span of Control management issues, which policy recommends as a ratio of between 1:3 and 1:7 (Federal Emergency Management Agency 2008d) (p 11). The Spinning Plates metaphor can be used to ingrain a visual manifestation of the task saturation and Span of Control issues commanders will likely face, and stimulate discussion of how these can be managed and overcome during training. Ideally, this conceptual metaphor will be recalled during *"real-world"* operations acting as an aide-memoire so the embedded knowledge will reduce the likelihood of the plates crashing down.

5.5.3.5 The Virus and Antidote – An Alternative Perspective?

Fig 5-12: The Virus and Antidote Metaphor



- Image source: (Cancer Research Institute 2015)

Despite finding that Command and Control was almost the air that emergency manager's breath, this study demonstrated that understanding varied. These conceptualisations have traces and influences of the traditional model, which have manifested in an almost spiritual faith in the system and single loop learning process (Argyris 2002, McEntire 2015). As such, many practitioners and some academics are either unwilling or unable to look beyond Command and

Control. What is needed is a tool to open the minds to both existing and new influences, and innovative ways of conceptualising *"disaster"* and *"catastrophe"* response, because existing approaches are limited, and are not up to the challenges of the future (Bissell 2013, Lagadec 2007).

The Virus and Antidote metaphor is a derivative of Morgan's (2007) Organism metaphor. It is influenced by medical biology and is designed to flip the traditional hierarchical Command and Control frame by challenging the core ethos that *"somebody needs to be in charge",* building on known critiques of Command and Control. In layman's terms, when an antidote is introduced into the body it seeks out the virus, attacks and destroys it cleaning out the infected cell. The antidote builds up in the system, cleaning then reproducing within infected cells and moving on repeating the process until the virus is eradicated. There is no formalised Command and Control; the antidote does not have a structure of commanders agreeing priorities and actions: there is no one in charge. It is a decentralised way of working, at a cellular level the antidote simply enters a cell does its job as best it can and moves on. If it fails, the virus remains until another (or alternate) dose of antidote enters the cell or the cell dies. As a simple metaphor for decentralised response, this perspective offers an alternative way of conceptualising operations.

In the most severe of disasters existing Command and Control frameworks become more and more ineffective as the scale increases. The Virus and Antidote metaphor simply advocates that at some point organisations and individuals will be isolated and left to their own devices, as this is a reality of catastrophe (Bissell 2013, Fischer 2003, Lagadec 2007, Quarantelli 2006). When existing Command and Control fails, and it will, rather than struggling to operate in a failing mechanistic hierarchical framework, a reorganisation into a decentralised organismic model based on Virus and Antidote principles should occur and be built into exiting mechanisms (Morgan 2007). Within this approach, traditional Command and Control is dispensed with and flexible, emergent structures simply operate in their local area until normal systems can operate again; the approach is for all intent and purposes a contingency arrangement for Command and Control (Dynes and Quarantelli 1968, Dynes, Quarantelli and Kreps 1981, Dynes 1983, Dynes 1994). This builds upon Groenendaal, Helsloot and Scholtens' (2013) (p128) recommendation of *"task adjustment through stigmergy – a form of self-organizing, bottom up coordination in which activities are neither centrally controlled nor locally supervised".* Such behaviour is not new idea; indeed it is well understood within academia so the metaphor is in part designed to close the gap between academic and practitioner knowledge.

Practitioner objections, such as lack of coordination, ineffectiveness and duplication of effort may well be the case and are likely true to a certain extent. However, Complex Adaptive Systems theory (CAS) demonstrates that many natural systems, such as the brain and societies to which Command and Control is applicable, evolve, adapt and indeed thrive without

centralisation (Chan 2001), highlighting another gap between known theory and practice. Time and again these factors and considerably worse occur when Command and Control fails. *"Disaster"* and *"catastrophe"* are worst-case scenarios and Command and Control is an ideal plan for what organisations want to happen. When it works, the frameworks are effective, but when they breakdown something else is needed, and the decentralised ethos that the Virus and Antidote metaphor advocates already occurs post disaster. The 50 plus years of disaster sociology literature, which indicates the occurrence of pro-social collaborative behaviour evidences this. FR1 also highlighted post-disaster behaviour linked with this metaphor amongst cut-off and isolated communities:

- FR1 (US): *"it worked very well because everybody individually erm stepped up created their own Command and Control knowing that eventually we would eventually get back together… knowing eventually our systems would be back up and running the government would eventually be there to assist erm and so there was no panic you know there's know none of that the big thing is you need to make sure that the public is calm and has erm… what's the word… and they have erm… confidence in the government that they are being taken care of because without that then you are gonna have anarchy"*

Such activity is a frequent post-disaster occurrence, though does not conform to the expected policy or media narrative and, thus is not adequately planned for (Schneider 1992, Tierney, Bevc and Kuligowski 2006). Such behaviour should form the basis for Command and Control back-up arrangements for the most severe of *"catastrophes"*. However, it would require a fundamentally different way of thinking involve adopting principals drawn from the Emergent Human Resource Model (EHRM) and built upon, not to replace Command and Control but to complement it (Drabek 1985, Dynes 1981, Dynes 1994, Neal and Philips 1995, Webb 2014). Command and Control may well be the Ying and EHRM based approaches the Yang in a synergistic model of the future. Whilst, the use of community based approaches are increasing they are but a scratch on the surface (Berkes and Ross 2013, Coles and Buckle 2004, Federal Emergency Management Agency 2011, Federal Emergency Management Agency 2014m, H.M. Government 2011a, Kapucu 2015), what is needed is a fundamental change which is epitomised by S2's comments below:

- S2 (US): *"Oh boy there we've got erm this whole system of Command and Control would not be necessary at all if everybody was self-reliant and resilient and able to take care of themselves and smart enough to not put themselves in hazards way but that would mean that everyone would need to high levels of education of what those hazards are it's just not realistic to expect that's gonna happen and how to protect themselves but that's the goal that we want to try to achieve and that is having people to be able to take care of themselves be resilient in the face of all hazards all the time*

and that would essentially eliminate the need for Command and Control for the application of resources to help the people in recover from things"

In the developed world such a cultural shift is perhaps unlikely. The CCIT-Box can help promote, and indeed provoke, debate regarding Command and Control, disaster response and human behaviour in order to develop greater insight and critical understanding. Einstein is believed to have said, *"the definition of insanity is doing the same thing over and over again, but expecting different results"*. The CCIT-Box is but a small step towards a double loop learning process intended to avoid the foolishness of not re-evaluating the philosophy on which emergency management is based. This is not an easy task, indeed in some quarters it may not be welcomed. But when it comes to saving lives, it is our duty to continually push the boundaries, to challenge the norms and values of our practices, to look for better more effective and innovative ways of doing things for the life that could not be saved today may well be one that we can save tomorrow.

5.6 Chapter Summary

Command and Control is a central aspect of emergency management, the findings show that it is almost the air that emergency mangers breathe. Indeed, the concept is so deeply woven into practitioner's cognitive fabric that it is not overtly questioned, personified by a quasi-religious systemic faith that Command and Control is the right thing to do. This is drawn from a strongly held belief that the approach is essential, as it is needed to bring order to perceived chaos. This is influenced by the militaristic origins of Command and Control, the historic influential role of the armed forces in society, transition of personnel, culture and doctrine post-Cold War, which perpetuates a top-down hierarchical frame, and the continued dominance of the traditional model (McEntire 2015).

This systemic faith is underpinned by a logically formed, but unrealistic, hope that help will always come, which forms a psychosocial coping mechanism, and solidifies Command and Control's influence over practice meaning change will be difficult to implement. Furthermore, this dominant hierarchical and militaristic frame is blind to the extensive body of disaster scale and sociology research that has consistently found that pro-social behaviour follows disaster and that complexity occurs as disaster scale grows, indicating a significant gap between knowledge in practice and academia.

The linguistic and visual findings provided a unique insight into both the language and imagery of emergency management. Though, the data set provided a broad set of interpretations of Command and Control, a core hierarchal frame based on the heavy use of the Status is Position metaphor in both domains was uncovered. Although, this common view has been shown to be intrinsically vulnerable to false assumptions and scale limitations, which are not readily

acknowledged by practitioners. However, the empirical and content analysis findings indicated a less standardised and more contradictory picture. The empirical findings showed that common themes existed based on Morgan's (2007) Brain, Culture and Machine metaphors, though a shared view was lacking, meaning key organisations did not interpret Command and Control in the same way. Building on this, the key content analysis themes were Terminology, Concept Uncertainty and Standardisation. This indicated, that despite similar language being used in the field, meaning was not unversal. So whilst attempts to standardise terminology and practice are being made, it is being used and understood in different ways across organsiations. Indeed, some organsiations belived standardisation is being achieved, whereas others did not, which in itself is an indication that key organsisations are not *"on the page*" advocating the need for this study and similar research in the future.

6 Conclusion

6.1 Introduction

This chapter reviews and reflects on the Aim, Objectives, research questions and main findings of the study. It also draws together the conclusions, which are formed into sections that detail the contributions to knowledge in terms of theory, methodology and practice. Recommendations are made for the emergency management field, which build on the knowledge and insights generated by the study. The limitations of this study and opportunities for future research are discussed in the subsequent section. The chapter and indeed thesis ends with a personal reflection on the study to give an experiential insight to the life cycle of the research process.

6.1.1 Review of the Aim, Objectives and Research Questions

The Aim, Objectives, CRQ and SRQs, outlined in chapters 1 and 2 respectively, are reviewed herein.

Aim

This study aimed to: *"identify linguistic and visual metaphorical interpretations of Command and Control held by British and American emergency management practitioners in order to enhance multi-agency interoperability*"

Objectives

1. *Develop a comprehensive literature review focused on Command and Control within UK and US emergency management*
2. *Assess the relevance of Morgan's* (2007) *organisational metaphors to UK and US emergency management*
3. *Produce linguistic and visual data that encapsulates emergency management practitioners' views on Command and Control*
4. *Identify linguistic and visual metaphors of Command and Control used by UK and US emergency management practitioners*
5. *Compare and contrast the findings inter and intra country to identify patterns and trends*
6. *Develop a suite of learning tools to enhance critical understanding of Command and Control*

Central Research Question (CRQ)

- *"How do U.K. and U.S. emergency management practitioners metaphorically interpret Command and Control?"*

Supporting Research Questions (SRQ)

1. *Is Morgan's* (2007) *organisational metaphor theory relevant to UK and US emergency management?*
2. *What metaphors do UK and US emergency management practitioners use to make sense of Command and Control?*
3. *Does understanding of Command and Control vary across key organisations in UK and US emergency management?*
4. *Do interpretational differences in Command and Control affect the level of interoperability between emergency practitioners?*

Reflecting on the research outcomes, it can be concluded that the study was a success as the Aim, Objectives, CRQ and SRQs were comprehensively achieved. Though, to support this claim it is necessary to examine how these were achieved and clearly demonstrate the contributions made.

6.1.2 Review of the Key Findings

As noted in the literature review, emergency management is practice orientated and under theorised; however there are important bodies of work addressing key research themes including Command and Control and disaster sociology, which are not fully integrated into current practice (Neal 2014, Quarantelli 2005, Rubin 2009, Smith and Wenger 2006, Tierney 2007). As such, Objective 1 focused on developing a comprehensive literature review in order to demonstrate that problems exist within current practice. The review adopted a purposive method, selecting the most appropriate materials focusing on literature that was central to the thesis to establish the scope of the narrative (Cooper 1988). The literature included disaster scales and theory, and a critical review of the origins and development of disaster research. The key themes focused upon were society's historic familiarity with disaster engendered through physical experiences and manifested through religion and mythology, and maintained through contemporary pop-culture. Interestingly, it was noted that despite this historic closeness scholarly interest in disaster took much longer to emerge and is a comparatively new academic field meaning the theoretical knowledge base is still in its relative infancy (Neal 2014, Tierney 1998).

The study was located within the developed-world emergency management literature, though the links between humanitarian and emergency response were clearly demonstrated. Indeed, the author posited that there is much to be learned from greater crossover, arguing that conceptually they are two-sides of the same coin, though this is not always reflected in practice.

A detailed critique of the evolution and development of emergency management followed, which demonstrated the relative newness of existing Command and Control frameworks. The philosophy of Command and Control was reviewed and critiqued to demonstrate society's historic familiarity, and to a certain extent comfort, with authoritarian hierarchies and being told what to do, resulting in this approach becoming culturally embedded (Bendix 2001, Gilbert 2008). Consequently, as a result of this societal affinity with both disaster and hierarchical management the UK and US Command and Control frameworks, which date from the 1970's, feel much older and have become so heavily embedded (Cole 2000, Dynes 1994, Hills 1994, McEntire 2015), that, in the words of the author, *"they have become almost the air that emergency manager's breathe".*

A theoretical framework was then constructed within the management and organisations domain using culture, identity and metaphor to facilitate a multi-lensed critique of existing practice. The review demonstrated that practice is impacted by cultural and identity problems that can have both a positive and negative influence on disaster response. Inter and intra-organisational cultures and sub-cultures may or may not align, differing identities often clash and rivalries, politics and *"red-tape"* can marginalise or ostracise organisations and informal groups compromising efficiency; yet, despite these limitations these frameworks are still retained (Tierney 2001, Waugh 2009b). The literature review highlighted theoretical, historic and practical limitations related to the use of Command and Control, which established the CRQ by identifying a clear research gap, and thus comprehensively achieved Objective 1.

Disaster research has historically been typified by inductive field studies (Lindell 2011, Stallings 2006). Often, a specific disaster or organisation has provided the focal point for the research (Fischer et al. 2006, Hogg 1980, Holguin-Veras et al. 2007, Kapucu 2006, Laska and Morrow 2006, McEntire et al. 2013, Wachtendorf, Brown and Holguin-Veras 2013, Waugh 2009a, Wenger, Quarantelli and Dynes 1989). The cited works presented interesting and much valued contributions, so the purpose herein is not a critique. Rather, it is to highlight the important contribution this study has made in terms of international comparative research, as there are *"few publications to address emergency management from a comparative perspective*" (McEntire 2010) (p 12). Furthermore, a considerable amount of the literature stems from the US so this work adds to the growing body of international work (Dynes 1988, McEntire 2010, Tierney 2007). It is notable that in McEntire's (2010) edited volume *"Comparative Emergency Management: Understanding Policies, Organizations and Initiatives from Around the World"*, the chapter on UK emergency management, although an excellent piece, was not written by a UK academic or practitioner, rather by the esteemed Naim Kapucu based at the University of Central Florida (Kapucu 2010). Again, this is an observation rather than a criticism used to highlight the limited body of comparative UK/US research to which this study contributes, and indeed the relatively small body of UK emergency management research as a whole. There are excellent works, such as those by O'Brien (2005, 2006, 2007), Andersen and Adey (2011,

2012, 2010, 2011, 2012), Flin, Crichton and Arbuthnot (2008, 2005, 2002), Hawe, Wilson and Coates (2012, 2011), and Pollock (2013, 2015) amongst others. However, it is lacking critical mass. This study made a direct contribution to the UK literature with the paper *"Facing Disaster with Wide Are Emergencies"* (McAleavy 2010), which was subject to a Publisher's inquiry for an extended manuscript and will be developed in the future. Also, the initial framework, on which the Candle metaphor was based, was presented at the *"Royal United Services Institute (RUSI) Command and Control 2010"* conference, at Whitehall, London on 30th-31st March 2010 (Royal United Services Institute 2010).

Objectives 2, 3, 4 and 5 were focused on the research strategy: to recap, this study adopted a comparative mixed methods interpretivist approach, which was detailed in Chapter 3 (Blaikie 2004a, Bryman 2012). Both Stallings (2006) and Lindell (2011) argued that mixed methods approaches were the future of disaster research, which provided impetus for the research design. The sample-frame engaged 30 highly experienced UK and US practitioners drawn from key organisations at all levels of command, which was novel in its holistic approach and therefore notable in its contribution. This study engaged Operational, Tactical and Strategic personnel at the local level, sub-national and state officials, and both UK national and US federal employees. By contrast, other studies have generally focused on a single organisation, organisational type or career-fields (Heijes 2007, Jensen and Yoon 2011, Jensen and Carr 2015, Marsar 2013, Wenger, Quarantelli and Dynes 1989), or a focusing disaster event, hazard or policy initiative (Holguin-Veras et al. 2007, O'Brien and Read 2005, O'Brien 2006, Wachtendorf, Brown and Holguin-Veras 2013). This study engaged 10 organisations across 2 countries on a key function within emergency management, and as Dynes (1988) (p 102) points out *"the significance of disaster…is brought sharply into focus when one takes a cross cultural and international view"*, which illustrates the important contribution made by this study (McEntire and Mathis 2007).

The research strategy was primarily inductive, though an initial deductive weighted summation method was used to assess the relevance of Morgan's (2007) organisational metaphors (Fischer 2003, Trochim 2006a, Zardari et al. 2015). This transferral of a widely accepted organisations theory into a new domain established a framework for use in the crux of the research. The field study was a series of 31 inductive semi-structured interviews (1x pilot, 15 UK and 15 US), which were analysed using content analysis to provide context, and linguistic and visual metaphor analysis techniques (Lakoff, Espenson and Schwartz 1991, Morgan 2007, Neuendorf 2002, Steen et al. 2010). This study paid homage to the traditions of the discipline by using inductive field interviews, and then built upon this with a comprehensive, innovative and novel methodology. The blend of content and linguistic metaphor analysis coupled with the application of visual methodology inspired by the work of Schachtner (2002) delivered an innovative methodology in meeting Objectives 2, 3, 4 and 5. This assessment was based on demonstrating the relevance of Morgan's (2007) metaphors to emergency management

(Objective 2), which informed the development of the Interoperability Metaphor Analysis (IMA) tool. The induction of over 500 linguistic and 30 visual metaphors (Objectives 3), were analysed and refined using both Morgan's (2007), Lakoff, Espenson and Schwartz's (1991) metaphors and a general category, which have not been applied either individually or collectively in linguistic or visual form to emergency management prior (Objective 5). Furthermore, the Command and Control Interoperability Tool-Box (CCIT-Box) proposed a set of tools that combined significant theoretical and practical contributions that enhance critical understanding of Command and Control by closing the gap between academic and practitioner knowledge in a novel but meaningful way. For example, the posited Theory of Interoperability Metaphors (TIM) which establishes the basis of a new *"language of emergency management"* based on the use of metaphor within the spoken words of experienced practitioners. This study and further research can build our understanding of the recurrent use of mutually understood metaphors across individuals and organisations. The findings enhance interoperability as linguistic metaphor use offers a key to unlocking greater joint-understanding and timely communicative power, which are much needed traits in emergency management (Lakoff and Johnson 2003). These elements formed the major contributions posited by this study (Objective 6), and ensured the successful achievement of the Aim and Objectives.

6.1.3 Answering the Central Research Question (CRQ)

The CRQ asked, *"how do U.K. and U.S. emergency management practitioners metaphorically interpret Command and Control?"* Chapters 4 and 5 indicated that there was no simple and indeed no single answer to the question as Command and Control is interpreted in different ways. The findings however, provided a detailed and comprehensive answer to the CRQ beginning with the exploratory use of Morgan's (2007) metaphors as an analytical framework within emergency management. This provided a novel contribution as the theory though widely used in semantics, pragmatics, communications; media, business and management (Barbosa-de-Oliveira and Dias-da-Silva 2010, Billups 2011, Harries 1978, Lawley 2001) had not been applied to this field in this way prior. And, in doing so the framework demonstrated a range of metaphorical constructs that UK and US practitioners used to interpret and understand Command and Control answering, in part, the CRQ. Consequently, using Morgan's framework, practitioners viewed Command and Control as a Brain, Culture or Machine, which demonstrated that key organisations do not have the same understanding of Command and Control.

The study then built upon this initial step with a more in-depth linguistic element, which collated approximately 300,000 words and 500+ distinct linguistic metaphor-types across the 30 transcripts, which were detailed in section 4.3 and Appendix 6 and 7. The research outcomes noted shared and individual linguistic metaphors, and usage of Lakoff, Espenson and Schwartz's (1991) and Morgan's (2007) metaphors in natural speech, which established the theoretical basis of a metaphorical language of emergency management, The findings were

refined and developed into a Theory of Interoperability Metaphors (TIM), which has significant future research application. These addressed the CRQ answer, whilst making a significant contribution to knowledge by presenting avenues for future organisational interoperability and metaphorical linguistics research and opening up new theoretical constructs.

Command and Control was found to be so heavily embedded in practice that the author suggests *"it is almost the air that emergency managers breathe"*, despite current frameworks only emerging the 1970s, which aligns with Dynes' (1994) (p 142) dominant and McEntire's (2015) (p 112) traditional models. The linguistic and visual findings built upon this by illustrating the range of metaphorical frames used, which were relatively broad ranging. These included shared metaphors such as, Status as Position, Progress is Forward Motion, Cooking, Games & Play and Conducting Research is Solving a Problem. UK individual metaphors including, Natural World, Construction, Acting is Feeding On, Navigation; the Mind is a Container for Objects and, Clothing and Shopping. And, US individual metaphors, Obstacles to Action are Obstacles to Motion and Ideas are Constructed Objects.

The overwhelming use of the Status is Position metaphor in both linguistic and visual domains indicated that a clear top-down hierarchical frame exists. This was linked to a quasi-religious faith in Command and Control as being essential to bring order to the chaos of disaster, despite a significant body of academic research that suggests otherwise. This faith was underpinned by a sacrosanct and idealistic belief that higher levels of command will always provide aid, which was unsupported by the literature, and seemed to form part of a psychosocial coping mechanism. The result is a heavily embedded philosophy, which is enshrined in practice through legislation. Though, despite Waugh's (2009c) (p 172) view that it has all the trademarks of a fad this fundamental belief will be hard to change even though research indicates it is necessary to combat the disasters of tomorrow (Bissell 2013, Wenger, Quarantelli and Dynes 1990).

This study defined and clearly articulated important bodies of literature pertaining to disaster, disaster scales, Command and Control limitations and disaster sociology, which are almost entirely ignored in practice. A major contribution, was not in demonstrating a gap between academia and practice as that has been noted (Jensen et al. 2014, Neal 1993, Neal 2014, Quarantelli 2005, Rubin 2009, Smith and Wenger 2006, Tierney 2007), but rather in demonstrating the extent of this divergence in a comparative study of 2 countries that includes high-level practitioners at all levels of the respective Command and Control frameworks. Thus, the contribution is in building on the previous research by defining the scale of the knowledge gap in a holistic and comparative manner, and developing tools to narrow it. Furthermore, this study also advanced the work of Pollock (2013), who focused on persistent interoperability lessons identified but not being learnt, by demonstrating the prevalence of a single loop in terms

of UK and US Command and Control learning, which currently inhibits systemic criticality, helping to maintain the *status quo* (Argyris 2002).

Furthermore, 30 visual metaphors were collated with notable ease as each participant took only a few minutes to produce a rich depiction of Command and Control. These images demonstrated the communicative power of visual methodology to quickly transmit complex and detailed information, which provided a snapshot of how the sampled practitioners metaphorically interpreted Command and Control (Banks and Zeitlyn 2015, Pink 2012). 5 shared metaphors (between the UK and US participants) drawn from Lakoff, Espenson and Schwartz's (1991) Master List and a general category were noted; Status is Position, Progress is Forward Motion, Cooking, Games and Play, Conducting Research is Solving Problems. 6 UK metaphors were noted; Natural World, Construction, Acting on is Feeding, Navigation, the Mind is a Container for Objects and Clothing and Shopping, and 2 US Obstacles to Action are Obstacles to Motion and Ideas are Constructed Objects. Also, the use of Morgan's Culture, Organism, Machine, Political System and Flux and Transformation metaphors was found in practitioners' natural language. Similarly, 30 visual metaphors of Command and Control were collected and despite surface variability the almost universal use of the Status is Position metaphor was noted. Collectively, this blend of the linguistic and visual findings, which informed the learning tools, summarily answered the CRQ by illustrating the range of metaphors used by practitioners to interpret Command and Control.

6.2 Contributions to Knowledge

6.2.1 Contributions to Theory

This study clearly demonstrated the power of metaphor, both linguistic and visual, to communicate greater depth and meaning beyond the spoken word (Lakoff and Johnson 2003, Ortony 1998). The key theoretical contributions were the Theory of Interoperability Metaphors (TIM) and the 5 conceptual metaphors namely Command and Control as a Candle, a Trivial Pursuit Pie, a Golden Thread, and Spinning Plates and as a Virus and Antidote.

TIM is in its infancy, however as this was a primarily inductive study opening up new theoretical domains for future researchers to develop was an entirely feasible and defensible outcome. Whereas, the conceptual metaphors are perhaps the more theoretically refined and polished research outcome, TIM likely has the most potential. Identifying, clarifying and refining a communicative framework based within an existing language using phrases (i.e. metaphors) already in wide-usage to enhance understanding in terms of clarity, timeliness and depth has undeniable benefits for emergency management where life is on the line. It is an exciting concept with research and practitioner benefits, and a strong theoretical contribution to the field, which can and will evolve and develop over time.

Much in the same way that Morgan's 8 metaphors enable a given organisation to be analysed from different perspectives, the theoretical framework established by the 5 posited conceptual metaphors engenders a deeper and more critical insight to Command and Control by using metaphor to stimulate both linguistic and visual domains to more effectively link theory to practice. The combination of visual imagery and supporting narratives, the complexity of which can be adjusted to meet the intellectual needs of differing audiences, offers a potent learning tool. In addition, each conceptual metaphor represents a theory of Command and Control and a critical perspective that adds to the current knowledge base. This will enable future researchers (and practitioners) to better understand the limitations of current practice and more readily develop enhancements and alternatives to Command and Control.

6.2.2 Contributions to Methodology

This study took Morgan's (2007) existing and well-accepted theory and for the first time applied it to emergency management and the visual domain to assess its relevance. Morgan's framework was then developed into an analytical framework using weighted summation, forming a methodological contribution to knowledge (Zardari et al. 2015). Interoperability Metaphor Analysis (IMA) was designed to illustrate perceptual differences in how practitioners interpret and make sense of Command and Control. IMA's contributions are two-fold: firstly, the ease through which it can be applied, either paper or digital. Secondly, it conveys an important learning outcome by heightening practitioners' awareness that they may not hold the same views and understanding of Command and Control as their multi-agency partners.

Building on the work of Schachtner (2002) this study posited Visual Interoperability Analysis (VIA) as a second methodological contribution. VIA is a multi-modal tool offering individual, group and practitioner applications to engender more critical perspectives on Command and Control. It is relatively simple to facilitate, does not take a great deal of time or equipment beyond pens and paper, and is effective in (literally) drawing out differences and similarities in perspectives by providing a visual communicative mechanism. Criticality is enhanced via compare and contrast discussions that follow the task, though this is minimal in the practitioner application. The contribution herein is two-fold; an application of Schachtner's (2002) visual metaphor approach in another field, and development of the VIA tool, which provides a simple but effective mechanism to engender greater criticality.

6.3 Contributions to Practice

Historically, disaster research has leant towards practical research as opposed to theoretical advancement mostly out of necessity as funding bodies favoured applied research as opposed to *"blue-sky"* thinking (Lindell 2011, Neal 2014, Quarantelli 1993, Stallings 2006, Tierney 2007). As such, this study balanced theoretical advancement and practical application (Lindell 2011). The CCIT-Box is applied theory in that the tools are designed to complement rather than

replace existing training initiatives. They can be used in whole or in part and simply dropped in where needed. They are simple to facilitate, require little by way of specialist equipment, and are flexible in that the theoretical complexity can be adjusted to suit any given audience. Thus, the CCIT-Box offers a significant contribution to practice by bolstering the learning and development arsenal with a set of theoretically sound, flexible and innovative tools that effectively narrow the gap between academia and practice.

6.3.1 Validated Learning Tools

The CCIT-Box is judged to be effective as the tools have been tried and tested in both academic and practitioner settings with positive results. In addition to the McAleavy (2010) article and the RUSI (2010) conference presentation, the Candle metaphor was presented at the Dealing with Disasters International conference held in Glamorgan, Wales on 28th-29th November 2011 (University of South Wales 2011). A session informed by this study entitled *"A New Training Methodology for Disaster Management Professionals"* was presented at the Higher Education Academy Geography and Environmental Sciences Symposium at Coventry University on 19th April 2013. A guest lecture that included an overview and a defence of the methodology, interim findings, and the Trivial Pursuit Pie metaphor was delivered to a distinguished audience, including full Professors, at the Institute of Hazard, Risk and Resilience (IHRR) at Durham University on 14th October 2013. Furthermore, the conceptual metaphors were used on Continuing Professional Development (CPD) contracts in Dubai, United Arab Emirates (UAE) at the International Emergency and Catastrophe Management Conference on 25th-27th March 2014. As well as the 3rd Emergency Healthcare Provider Conference on 10th-12th November 2015 and, the 11th Nursing Symposium on 9th-10th June 2015, both of which took place at Prince Sultan Military Medical City in Riyadh, Saudi Arabia.

The tools have also been integrated into the undergraduate (UG) and postgraduate (PG) disaster management programmes at Coventry University, where they were well received. Most notably, at the Masters level which includes a high number of experienced practitioners. Indeed, the *"challenge to current thinking around Command and Control by Tony McAleavy"* was noted in a 2015 PG Module Evaluation Questionnaire as the highlight of the module. The tools fuel critical discussion as they open up the mind to different ways of looking at Command and Control. Students readily engage with classroom discussions and many follow up the classes either via email or telephone in the following weeks, which demonstrates the power of the tools to promote deeper thought and reflection.

At their most basic, the tools advocate that not everyone interprets Command and Control in the same way; they stimulate critical discussion on interoperability and other key problems. They promote a simple message that you need to clearly understand how you and partner organisations understand Command and Control if you are to more effectively work together. Beyond that, they engender a deeper and more critical perspective by bridging the gap between

what is known in academia and practice using an innovative, novel and most importantly accessible mechanism based on the use of metaphor.

6.3.2 Reflective and Thought Provoking Communicative Mechanism

Those being taught do not necessarily have to agree with or indeed like the tools or perspectives associated with them. Indeed, the validation experience suggests that despite a core hierarchical frame differences are likely as perspectives vary. The CCIT-Box promotes individual thought and reflection; the tools are not designed to convince people that they are wrong or to promote standardisation. Ideally, their use should lead to some perceptual change, although mapping this is beyond the scope of this study. Even if someone remains locked in a single loop learning process, the individual reflection, the heightened awareness of differing perspectives and familiarisation with new concepts and issues associated with the tools, whether or not accepted, are still a valuable learning experience, and may well sow the seeds for future change however long that may take. It is this ability as an effective learning and communicative mechanism, which has been developed through a rigorous field study and validated through multiple activities, that ensures the CCIT-Box is a valuable and worthy contribution to practice.

Furthermore, the field-testing undertaken was in a multi-cultural environment. The classes included European and international students from Africa, Asia, the Middle East and North America, the CPD contracts were delivered in Middle-Eastern countries to international audiences from multi-faith backgrounds. Furthermore, the IHRR guest lecture, RUSI and Dealing with Disasters conference presentations were also delivered to international audiences that included academics, practitioners, and both the public and private sectors. This suggests that the tools have international and inter-cultural relevance. As the disaster research tradition is heavily westernised (Drabek 2004, Dynes 2004, McEntire 2004), there is a need for research with inter-cultural application, particularly given *"recent years have witnessed a significant increase in the occurrence and severity of natural and man-made disasters"* which engenders more culturally diverse responder communities (Wilson and Gosiewska 2014) (p 632). This need was addressed, to a certain extent, within this study, as the research outcomes are a communicative mechanism that has some inter-cultural applicability beyond the 2-country base from which the tools were developed. However, the extent of this relevance is currently unknown as assessing this was beyond the scope of this study, and is thus an area for future research.

6.3.3 Balance of Theoretical and Practical Application

Drabek (2004), Quarantelli (2005), Tierney (2007), Magsino (2009), Lindell (2011) and Neal (2014) rightly argue for greater theoretical rigour in disaster research to ensure the field's continued development and acceptance. Accordingly, this study adopted a balanced approach

to make both theoretical and practical contributions as *"research findings need to be better communicated and disseminated to emergency management professionals"* (Jensen et al. 2014) (p 165). The CCIT-Box is a practical contribution that delivers a set of innovative tools that effectively, flexibly and non-invasively communicates and disseminates research into practice, which is invaluable.

6.3.4 Summary of Contributions

The contributions forwarded by this study combine theoretical, methodological and practical elements in a communicative framework that enhances interoperability for emergency management organsiations. Whilst, also linking theory to practice in an accessible and innovative way. The contribution and their type are summarised in Fig 6.1 below:

Fig 6-1 Summary of Contributions		
No	**Contribution**	**Type of Contribution**
1.	Theory of Interoperability Metaphors	Theoretical
2.	Candle metaphor	Theoretical
3.	Trivial Pursuit metaphor	Theoretical
4.	Golden Thread metaphor	Theoretical
5.	Spinning Plates metaphor	Theoretical
6.	Virus and Antidote metaphor	Theoretical
7.	Interoperability Metaphor Analysis	Methodological
8.	Visual Interoperability Analysis	Methodological
9.	Flexible learning tools that complement existing practice	Practical
10.	Validated learning tools	Practical
11.	Reflective and though provoking communicative & learning mechanisms	Practical
12.	A blend of theory and practical application captured in the CCIT-Box	Practical

6.4 Recommendations

This study was designed as an exploration into the application of linguistic and visual metaphor as a communicative tool to enhance interoperability. So, *"just as Morgan's analysis opened up a whole new line of theorizing in the general organizational literature"* (Lang 2008) (p 1) perhaps the tools theorised herein can open up new ways of thinking about and framing Command and

Control within the disaster and emergency management literature. This grand aspiration could engender a greater understanding of Command and Control, resulting in opportunities for systemic improvements and potentially the development of alternative methodologies to meet the *"disasters"* and *"catastrophes"* of tomorrow though perceptual change would need to occur first (Quarantelli 2006).

6.4.1 One: Mainstream Command and Control Limitations Research

- **Recommendation 1: research on limitations of Command and Control methodology to be more overtly promoted and engaged within practice**

The limitations of Command and Control are well known to the academic community (Buck, Trainor and Aguirre 2006, CDRSS 2006, Dynes and Quarantelli 1968, Dynes 1983, Dynes 1994, Jensen and Waugh 2014, Kapucu 2006, McAleavy 2010, McEntire 2015, Neal and Philips 1995, Quarantelli 1986, Quarantelli 2002, Quarantelli 2006, Swope and Patton 2005, Tierney 2001, Tierney 1998), though these limitations are not readily acknowledged in practice. Also, post Hurricane Katrina in 2005 a *"catastrophe"* research agenda emerged (Bissell 2013, Lagadec 2007, Quarantelli 2006) which supported the view that *"ICS is not a universally applicable organizational form"* (Trainor 2004) (p vii). However, despite a growing body of literature and increasing monies through federal catastrophic grants Command and Control is deployed without understanding of its own intrinsic limitations (Federal Emergency Management Agency 2015b). Put more simply both ICS and GSB are deployed almost universally without a full understanding of what these frameworks can and cannot manage in terms of a disaster's scale, a situation that needs to be rectified as a matter of urgency.

Beyond the growing linguistic use of the term *"catastrophe"*, practice remains conceptually locked in a *'bigger the incident the bigger the Command and Control'* mind-set. Furthermore, the UK policy definition of a catastrophe (see Fig 2.7) still maintains that the Prime Minister would lead the response from Whitehall in London (H.M. Government 2013a) (p 9). This demonstrates no understanding of the implications of disaster scale or hyper-complexity suggesting that the UK is currently vulnerable to large-scale events due, in part, to a divergence between practitioner and academic knowledge (Bissell 2013, Kapucu 2010, Lagadec 2007, Quarantelli 2006). Thus, there is a need to more overtly acknowledge the limitations of existing approaches, establish a double loop learning process (Argyris 2002), and ideally develop both contingency arrangements and alternatives methodologies.

The political implications of mainstreaming known limitations of Command and Control are likely to be considered too high by power-brokers as the media tends to blame the Government for failures, whether actual or perceived (Schneider 1992). The recommendation herein is not to publicly state that current approaches are ineffective and assign blame, but rather to more effectively acknowledge, disseminate and employ known research within practice to enhance

it (Jensen et al. 2014). If practitioners are not aware of research findings then they will continue to do what they have always done and not proactively seek meaningful change. The CCIT-Box is a starting point, offering a mechanism to begin this process. What is needed is a broader theoretically informed policy base that encapsulates understanding that some disasters are indeed bigger than others linked to a paradigm shift based on the emerging *"catastrophe"* and hyper-complexity research that actually informs practice, which is no easy feat (Bissell 2013, Lagadec 2007, Quarantelli 2006).

6.4.2 Two: Mainstream Disaster Mythology and Sociology Research

- **Recommendation 2: Disaster Mythology and Sociology should be more overtly promoted and engaged within practice**

Disaster myths pervade the media and as a consequence emergency management policy (Barton 1969, Dynes 1994, McEntire 2015, Neal 2014, Stallings and Quarantelli 1985, Tierney, Bevc and Kuligowski 2006). Neal (2014) (p 3) stated *"we continue to see or participate in exercises with the disaster myths, when we see decisions made during disasters grounded in disaster myths, when we hear decision makers talk about disaster myths influencing their decisions (or being surprised that certain myths did not occur), then we must reconsider our efforts".* This study found that disaster myths, notably of chaos and panic, were strongly held beliefs, and observed a significant gap between key practitioner's understanding of disaster sociology and actual human behaviour noted in the literature (Barton 1969, Britton 1988, Drabek and Evans 2007, Drabek and McEntire 2002, Dynes 1970, Dynes 1973, Dynes, De Marchi and Pelanda 1987, Fischer 2003, Forrest 1988, Kreps 1984, Quarantelli and Dynes 1977, Quarantelli 1986, Schneider 1992, Stallings and Quarantelli 1985, Stallings 2005, Stoddard 1968, Tierney 1998). This is a significant issue that must be addressed, as *"in the aftermath of virtually every disaster situation, a "gap" exists between the emergent norms that guide social interactions and the bureaucratic norms that dominate governmental activity"* which needs to be closed (Schneider 1992) (p 135). Command and Control practice is founded on assumptions, myths and beliefs that are untrue and practitioners are surprised when the frameworks based on these fail, yet they only question what they do rather than why they do it: accordingly, the CCIT-Box provides a mechanism to effect real change (AFS Intercultural Programs 2015, Argyris 2002).

The posited conceptual metaphors help to address this problem, but are only a small part of what must be a wider strategy which mirrors the broader mainstreaming issues faced by disaster research (Tierney 2007). Such an initiative would be hampered by the professionalised nature of the field, particularly in the UK, and exacerbated by the *"strong anti-book or even anti-intellectualism strain in the profession"* (Neal 2014) (p 3). This needs to be overcome as a matter of urgency and embedding the CCIT-Box in practice can help.

6.4.3 Three: Develop a Metaphorical Language of Emergency Management

- **Recommendation 3: Develop a metaphorical language of emergency management to enhance multi-agency interoperability**

This study's findings clearly demonstrated the communicative power of metaphor, which was then harnessed by the CCIT-Box tools in a theoretical framework with both academic and practitioner applications. The posited Theory of Interoperability Metaphors (TIM) is but the start of a potentially exciting new research agenda, which build upon this initial study of the linguistics of emergency management. Building a greater understanding of what practitioners say, how they say it, and developing an understanding of what they actually mean when they say it is of critical importance to emergency management. Metaphor offers a mechanism to achieve this as they already exist within spoken language, as was demonstrated within this study, and they can be used to effectively develop and enhance understanding across multiple organisations (Lakoff and Johnson 2003, Morgan 2007).

Fig 5.7 outlined the initial TIM framework that can be tested with similar and dissimilar sample-frames of practitioners drawn from a broader range of organisations to refine and further develop the theory. Other metaphors will emerge as the research field develops and those currently established may diminish in importance as the lexicon expands. The initial qualitative approach, may give way to quantitative methods to determine empirical tendencies, and both multi- methods (qualitative or quantitative) and mixed methods (both) may also be used to advance the theory (Cresswell and Plano Clark 2011).

6.4.4 Four: Embed Learning Tools within Practice

- **Recommendation 4: Embed the learning tools within existing learning and development activities**

Embedding the tools will support the implementation of recommendations 1 and 2 by providing a flexible learning mechanism. These tools can be used to both demonstrate the limitations of Command and Control, and, in its current guise, to teach some aspects of disaster sociology in an accessible manner. This study outlined a number of barriers to change in terms of Command and Control practice resulting from its deeply embedded position. As such, a considered implementation strategy is required: for example promoting *"Metaphors of Command and Control"* training is likely to alienate practitioners due to its perceived academic nature as metaphor is not widely associated with practice. So, whereas this novelty is beneficial in an academic sense it is a potential weakness in practice. Hence, the CCIT-Box was designed in a flexible manner to complement existing learning and development programmes. Indeed, the word metaphor does not need to appear at all unless it is beneficial to discuss the

methodology. The tools can be used as a set or individually dropped into the existing programmes as necessary where the discussion-based format is used to promote critical reflection and deeper thought. The tools can simply be tagged onto existing GSB or ICS/NIMS training with minimal fuss as the equipment required is nothing beyond that of a standard training session (i.e. PowerPoint/laptop, paper, pens and a facilitator). Ideally, this should be rolled across the respective US and UK Command and Control frameworks to capture the local, state and national/federal levels of command, although research has identified significant problems with standardisation (Drabek 1985, Jensen 2009), and simply pushing out the CCIT-Box as new doctrine would likely add to the training burden leading to variable implementation (Jensen 2011, Jensen and Youngs 2015).

The recommended strategy would be a targeted approach facilitated via the UK Department of Communities and Local Government's (DCLG) Resilience and Emergencies Division's (RED) 4 geographic teams (H.M. Government 2013a) and the 10 Federal Emergency Management Agency (FEMA) Regions (Federal Emergency Management Agency 2014g). RED teams liaise with all UK LRFs and the FEMA regions liaise with the states meaning broad coverage up and down the Command and Control frameworks could be achieved. Given the involvement of RED and FEMA Region One within the study, the development of a *"train the trainer"* programme facilitated via RED and the FEMA Regions is feasible. This could be augmented through engagement with the UK Emergency Planning Society (EPS), the International Association of Emergency Managers (IAEM) and the FEMA Emergency Management Institute, which could bring academics and practitioners together, providing excellent opportunities to disseminate the CCIT-Box tools.

6.4.5 Five: Develop Collaborative International Network(s) for the Development of Command and Control Alternatives

- **Recommendation 5: Develop a collaborative international network(s) that engage both academics and practitioners to develop alternative and complementary approaches to Command and Control**

The tools are intended to stimulate perceptual change through engendering critical and deeper thought. There are already specialist interest groups, both academic and practitioner, that focus on Command and Control however, research into alternatives to Command and Control is very limited such is its dominance (Drabek 1985, Dynes 1981, Dynes 1994, Neal and Philips 1995, Scholtens, Jorritsma and Helsloot 2014). With the growing understanding of *"catastrophe"* and hyper-complexity, and an expanding research base the potential for further collaborative research exists, such as that used to develop the theory of hyper-complexity (Lagadec 2007, Lagadec 2006). Initially, the approach may be the much-maligned problem/solution model (Tierney 2007). Indeed, the tools could be used as a theoretical base which groups of academics and practitioners could then build upon to collectively develop

alternatives to the dominant Command and Control model. In the first instance, establishing 2 hubs, 1 in the UK and 1 in the US, then expanding through RED/FEMA and the academic community would establish a collaborative international network to take this important research theme forward. Part of this work would be to connect with other existing disaster research networks *as "disasters impact all nations directly or indirectly"* (McEntire 2010) (p 5) to establish synergies wherever possible. Disasters bring numerous organisational actors together within Command and Control, which has known and unknown limitations to what it can achieve. Thus, we must collaboratively strive to understand our current frameworks in more depth, and look to develop alternative and complimentary approaches to effectively manage the disasters of tomorrow.

6.5 Limitations of the Study

All research has limitations derived from the characteristics of the research design, which influence the interpretation of the findings, their validity, generalisability, utility, and the contributions to both theory and practice (University of Southern California 2015). These limitations are not necessarily faults but rather opportunities to reflect, learn and develop opportunities for future research. Although, reflecting on the limitations of research and outlining avenues of future research *"is not addressed in the editorial guidelines of any of the major management journals"* it is certainly a valued component within this study (Brutus, Aguinis and Wassmer 2013) (p 64).

6.5.1 Limited Sample Frame

This study engaged 30 practitioners and 10 organisations across 2 countries within a purposive sampling method (Bryman 2012, Walliman 2006). This strategy was wholly appropriate for the adopted interpretative philosophy, the Aim, Objectives CRQ, SRQs and mixed methods approach (Schwandt 2000). However, the findings are a snapshot so they are not representative of or generalisable to UK and US emergency management (Carr and Jensen 2015). This was never the Aim, as the primarily inductive approach resulted in the development of new theory in the form of the learning tools, which provided the core contributions to knowledge. That said, the expansion of the study to include a wider sample-frame with more participants, drawn from a broader range of organisations such as the voluntary and private sectors and academia, and the inclusions of other countries (as was originally intended) would have resulted in a deeper, richer and more generalisable data-set and perhaps new metaphors. However, this was beyond the intended scope as to achieve this was deemed outside the SMART philosophy adopted and the resources available (Bogue 2005, Drucker 2011).

6.5.2 Weighted-Summation Method

The weighted summation method (Zardari et al. 2015) used to assess the relevance of Morgan's (2007) metaphors was limited in nature. This was by design as the approach taken achieved the necessary outcomes, and the limitations were readily acknowledged within the methodology. A fully quantitative approach could have provided more than a relative indication of perceptual differences by adding actual value to the figures generated, and significance to the differences between the levels of perception. However, this was not required to achieve the Aim, Objectives and CRQ. Reflecting on this research element, whilst it achieved the intended outcomes, its contribution to the overall study is somewhat limited. Therefore, with the benefit of hindsight a fully qualitative research strategy may have been preferable.

6.5.3 Project Scope

During the early stages of research it was necessary to refine the focus of the study to ensure that it was SMART (Locke 1968, Locke and Latham 2002). As a consequence, not only was the country and organisational sample-frame reduced but the scope of the interview question schedule was also narrowed. A decision was taken to focus on interpretations of Command and Control only, and to omit questions on disaster scale, although the open nature of the interviews allowed for some discussion of this. The rationale was that disaster scale was not within the Aim and Objectives and the question schedule already contained 18 questions. This decision was ratified as the interviews averaged between 60 and 90 minutes, 500+ linguistic and 30 visual metaphors were collated resulting in the development of the CCIT-Box. Greater integration of disaster scale theory within the field-study would have added an interesting dimension. However, this was not feasible as the question schedule would have become unmanageable and the interviews overly long, which may have risked participant rapport and interest (Chrzanaowska 2002).

6.6 Opportunities for Future Research

Knowledge builds through incremental development, a theory is developed it is accepted then it is refined and sometimes replaced over time (Bryman and Bell 2011, Saunders, Lewis and Thornhill 2008). Thus, research should never really stand still and as this study was a preliminary exploration of metaphor use in emergency management a number of opportunities for future research emerged. A summary of these is provided in Fig 6.2 below:

Fig 6-2: Opportunities for Future Research
1. **Measuring perceptual change through CCIT-Box usage:** the tools are designed to engender deeper more critical thought. An avenue of future research could be to measure the perceptual changes triggered by CCIT-Box usage. This could be through quantitative, qualitative or mixed methods research, which would make an interesting continuation of this study

2.	**Expanded Study:** a further study using the same or similar methods applied to a larger sample-frame and geographic area, and/or additional countries would result in more generalisable data
3.	**Development of the Interoperability Metaphor Analysis (IMA) Method:** IMA was designed as a simple method to identify perceptual differences. Further development of the approach using a fully quantitative approach that statistically defines the differences between perceptions would enhance the method. This could also be digitised to speed up application of the method
4.	**Why is Command and Control Essential?:** a spin-off of this study focused on investigating why practitioners believe Command and Control to be essential would be an interesting advancement of this research. A variety of methodologies embracing qualitative, quantitative or mixed methods approaches using either questionnaires, focus groups or interviews could be employed effectively to investigate this hypothesis
5.	**A Study of Principal Agent and Social Networks within Command and Control:** an interpretive study using a combined principal agent and social network framework to map perceived power dynamics and relationships within a given Command and Control framework would be a useful research addition. Semi-structured interviews and visual methodology could be used
6.	**Command and Control as a Psychosocial Coping Mechanism:** a deductive psychology informed study to investigate a hypothesis of Command and Control as a psychosocial coping mechanism would advance the findings of this research. This study would offer an interesting and valuable contribution that would help understand why Command and Control has become so dominant and almost sacrosanct to UK and US practitioners
7.	**Develop a Metaphorical Language of Emergency Management:** this study posited a Theory of Interoperability Metaphors (TIM). Combining these findings with known communications and linguistics theories in further research could produce an interesting study that would have application for organisational interoperability in helping practitioners communicate more effectively
8.	**A Study of Perceptions of Disaster Scale:** building on the disaster scale theory covered in the literature review, it would be interesting to conduct a study of what practitioners consider to be an emergency, disaster and a catastrophe then compare the findings with the literature
9.	**Gender Issues within Command and Control:** this study included 5 female participants CG1, LG3, P2, F3 and A2. The sample-frame was purposive and gender was not a determining factor. CG1 was the only participant to raise gender issues noting a perceptual difference between commanding and bossy with males being the former and females the later. An inductive exploration of gender issues within Command and Control would be an interesting prospect

10.	**Develop Conceptual Metaphors to address other Emergency Management problems:** the CCIT-Box is envisaged as a constantly developing entity. Overtime, the tools will be refined, developed, replaced and added to. Indeed, at the time of writing a further conceptual metaphor is underdevelopment *"recovery as the missing piece of the jigsaw puzzle"* which, is designed to address the lack of integration of recovery within conceptualisation of Command and Control
11.	**Use of this Study's Methodology in other aspects of Disaster Research:** one of this study's contributions was a novel and innovative methodology that used both linguistic and visual approaches. Thus, there is potential to apply these methods in other areas of disaster research, and indeed to study Command and Control in other cultural and international settings
12.	**Further Comparative Command and Control Studies:** Command and Control is seen by many countries as the model to aspire to. The United Arab Emirates (UAE) has adopted the UK GSB model, this presents an interesting research opportunity to investigate both practical and cultural issues as the wholesale transferal of a policy from one nation to another raises a number of significant concerns (Alteneiji 2015, McEntire 2010)

6.7 Personal Reflections on the Study

A PhD is a long and often lonely process, perhaps even more so for a part-time distance student; it is full of peaks and troughs, though it is one that has been immensely rewarding, enlightening and fulfilling. When I started out on this journey I was a practitioner, a Local Government Civil Contingencies Officer (CCO) in Country Durham based some 325 miles from the University of South Wales. As this study progressed so did my career. Building on my prior H.M. Coastguard and Ambulance Service experience, I was promoted to Senior CCO, then Deputy Civil Contingencies Manager and Civil Contingencies Manager, the highest-ranking emergency manger in the organisation. This experience augmented my research by exposing me to emergency management on a daily basis and incident command throughout all levels of the GSB framework, which was invaluable to my research. However, it was career and life events in 2012 that truly set this study in motion. In January 2012 (now) Professor Martin Rhisiart became my Director of Studies; in July 2012 I joined Coventry University as a Senior Lecturer in Disaster Management and my son Oliver James McAleavy was born on September 19th 2012. The combination of the reinvigorated support, the new full-time academic environment and my family has been critical in bringing this project to completion, and without it I may have floundered.

Similar to many early stages PhD researchers, I was somewhat uncertain and took time to focus my studies and understand what a PhD actually was (Phillips and Pugh 2007). This was perhaps exacerbated as a part-time distance student and a full-time practitioner. I can remember numerous occasions of sitting down to research on an evening or a weekend only to be deployed. Admittedly, I loved the operational work, that was why I did the job and I still miss it, but it wasn't an ideal way to complete a PhD. Indeed, of Phillips and Pugh's (2007) ways of not getting a PhD I've probably *"achieved"* most of them, taking several promotions and a career change with 2 house moves, and a child thrown in for good measure. However, as Hannibal informed his generals when told elephants could not cross-mountains, *"aut viam invenian aut faciam"* - I'll either find a way or make one, and I did (Knox 1922) (p 27). I am proud of this submission, as I believe it makes a valuable contribution. It has likely been my biggest challenge to date. Undoubtedly, there will be many more but I am thankful for the knowledge, skills and resolve that I have gained as the experience will serve me well.

7 Appendix

7.1 References

107th US Congress (2002) *Homeland Security Act of 2002* [online] available from <http://www.gpo.gov/fdsys/pkg/PLAW-107publ296/pdf/PLAW-107publ296.pdf> [January 5th 2015]

109th US Congress (2006) *Post-Katrina Emergency Management Reform Act of 2006* [online] available from <https://www.congress.gov/bill/109th-congress/senate-bill/3721> [January 7th 2015]

9/11 Commission (2004) *The 9/11 Commission Report: Final Report of the National Commission on the Terrorist Attacks upon the United States*. Washington D.C. US: National Commission on Terrorist Attacks Upon the United States

9/11 National Memorial and Museum (2005) *9/11 Interactive Timeline* [online] available from <http://timeline.911memorial.org/#Timeline/2> [November 30th 2011]

Abkowitz, M. D. (2008) *Operational Risk Management A Case Study Approach to Effective Planning and Response*. Chichester, UK: Wiley

Acharya, D. D. B. (2002) *The Essence of Hinduism*. 2nd edn. New Delhi, India: Prentice Hall

Adamski, T., Kline, B., and Tyrrell, T. (2006) 'FEMA Reorganization and the Response to Hurricane Disaster Response'*. Perspectives in Public Affairs* 3 (Spring), 3-36

Adey, P. and Anderson, B. (2011) 'Event and Anticipation: UK Civil Contingencies and the Space-Times of Decision'*. Environment and Planning A* 43 (12), 2878-2899

Adey, P. and Anderson, B. (2012) 'Anticipating Emergencies: Technologies of Preparedness and the Matter of Security'*. Security Dialogue* 43 (2), 99-117

Advanced Life Support Group (2011) *Major Incident Medical Management and Support: The Practical Approach at the Scene*. 3rd edn. Wiley-Blackwell: BMJ Books

Adwar, C. (2014) *The NYPD and FDNY have A Long History of Dispute*. http://www.businessinsider.com/the-nypd-and-fdny-have-a-long-history-of-disputes-2014-4?IR=T edn. Law and Order: Business Insider

AFS Intercultural Programs (2015) *Single-Loop and Double-Loop Learning Model* [online] available from <http://www.afs.org/blog/icl/?p=2653> [April 1st 2015]

Agranoff, R. (2006) 'Inside Collaborative Networks: Ten Lessons for Public Managers'*. Public Administration Review* 66, 56-65

Aiken, H. D. (1956) *The Age of Ideology: The 19th Century Philosophers*. New York: New American Library

Alberts, D. S. and Hayes, R. E. (2006) *Understanding Command and Control - C31/Command and Control Research Program*. Washington D.C. US: Assistant Secretary of Defense

Alexander, D. (2005) 'An Interpretation of Disaster in Terms of Changes in Culture, Society and International Relations'. in *What is a Disaster?: New Answers to Old Questions*. ed. by Perry, R. W. and Quarantelli, E. L. Philadelphia US: Xlibris, 25-38

Alexander, D. (2002a) *Principles of Emergency Planning and Management*. Oxford ; New York: Oxford University Press

Alexander, D. (2002b) 'From Civil Defence to Civil Protection - and Back again'. *Disaster Prevention and Management* 11 (3), 209-213

Allen, K. (2004) *Max Weber: A Critical Introduction*. London, UK: Pluto Press

Alteneiji, H. R. (2015) *A Strategic Approach to Emergency Preparedness in the U.A.E.* [online] PhD thesis or dissertation. Online: University of Salford

Alvarez, W. (1980) 'Extraterrestrial Cause for the Cretaceous-Tertiary Extinction'. *Science* 208 (4448), 1095-1108

Alvesson, M. (2002) *Understanding Organizational Culture*. London, UK: SAGE Publications

Alvesson, M. (1993) 'The Play of Metaphors'. in *Post-Modernism and Organizations*. ed. by Hassard, J. and Parker, J. London, UK: Sage Publications, 114-131

Anderson, B. and Adey, P. (2012) 'Governing Events and Life: 'Emergency' in UK Civil Contingencies'. *Political Geography* 31 (1), 24-33

Anderson, B. and Adey, P. (2011) 'Affect and Security: Exercising Emergency in 'UK Civil Contingencies''. *Environment and Planning D: Society and Space* 29 (6), 1092-1109

Anderson, B. (2010) 'Security and the Future: Anticipating the Event of Terror'. *Geoforum* 41 (2), 227-235-235

Andrews, M., Sclater, S. D., Squire, C., and Tamboukou, M. (2002) 'Narrative Research'. in *Qualitative Research Practice*. ed. by Seale, C. and Gobo, G. London UK: SAGE Publications, 97-112

Andrews, T. (2012) *What is Social Constructionism?*. http://groundedtheoryreview.com/2012/06/01/what-is-social-constructionism/ edn. Birdhouse: Grounded Theory Review: An International Journal

Anna Marie College (2014) *Origins of US Emergency Management* [online] available from <http://online.annamaria.edu/mpa/resource/emergency-management-history> [30th November 2014 2014]

Arbuthnot, K. (2008) 'A Command Gap? A Practitioner's Analysis of the Value of Comparisons between the UK's Military and Emergency Services' Command and Control Models in the Context of UK Resilience Operations'. *Journal of Contingencies & Crisis Management* 16 (4), 186-194

Archer, M., Bhaskar, R., Collier, A., Lawson, T., and Norrie, A. (eds.) (2007) *Critical Realism: Essential Readings.* London: Routledge

Arduini, S. (ed.) (2007) *Metaphors.* 1st edn. Rome: Storia e Letteratura

Argyris, C. (2002) 'Double-Loop Learning, Teaching, and Research'. *Academy of Management Learning & Education* 1 (2), 206-218

Arnold, J. L. (1988) *The Evolution of the 1936 Flood Control Act*. Fort Belvoir, Virginia, US: US Army Corps of Engineers

Asgary, A. (2010) *Emergency Management Discussion at York University, Toronto, Canada 09/12/2010* [type of communication] to McAleavy, T. [2010]

Ash, R. (2014) *National Response Coordination Center: It Takes A Whole Community for Response* [online] available from <https://www.fema.gov/employee-news-and-announcements/national-response-coordination-center-it-takes-whole-community> [March 31st 2015]

Ashkanasy, N. M., Wilderom, C. P. M., and Petersen, M. F. (2011) *The Handbook of Organizational Culture and Climate*. 2nd edn. Thousand Oaks, California, US: SAGE Publications

Association of Space Explorers (2008) *Asteroid Threats: A Call for Global Response* [online] available from <http://www.space-explorers.org/ATACGR.pdf> [March 13th 2009]

Association of State and Territorial Health Officials (2014a) *Robert T. Stafford Disaster Relief and Emergency Assistance Act* [online] available from <http://www.astho.org/Programs/Preparedness/Public-Health-Emergency-Law/Emergency-Authority-and-Immunity-Toolkit/Robert-T--Stafford-Disaster-Relief-and-Emergency-Assistance-Act-Fact-Sheet/> [December 18th 2014]

Association of State and Territorial Health Officials (2014b) *Emergency Management Assistance Compact Fact Sheet* [online] available from <http://www.astho.org/Programs/Preparedness/Public-Health-Emergency-Law/Emergency-Authority-and-Immunity-Toolkit/Emergency-Management-Assistance-Compact-Fact-Sheet/> [January 3rd 2015]

Atsma, A. J. (2015) *Moirae: The Fates, Greek Goddesses of Fate and Destiny* [online] available from <http://www.theoi.com/Daimon/Moirai.html> [November 27th 2015]

Auf der Heide, E. (2004) 'Common Misconceptions about Disasters: Panic, the "Disaster Syndrome," and Looting'. in *The First 72 Hours: A Community Approach to Disaster Preparedness*. ed. by O'Leary, M. Lincoln, Nebraska, US: iUniverse Publishing, 340-380

Avery, G. C. (2004) *Understanding Leadership: Paradigms and Cases*. London: Sage Publications

Ayre, J. (2004) *How Effectively can a Best Value Review be Undertaken within a Local Authority Emergency Management Service?*. Unpublished Doctoral thesis or dissertation. Newcastle: Northumbria University

Baaraspul, H. C. (2009) *Do Employees Behave Differently in Public Vs Private Sector Organizations" A State of the Art Literature Review*. MSc Thesis edn. University of Twente: School of Management and Government

Babbie, E. (2013) *The Practice of Social Research*. 13th edn. Belmont, C.A., U.S.A.: Cengage Learning

Baca, A. M. (2008) *On Call - Disaster Reserve WorkForce News* [online] available from <http://www.fema.gov/pdf/dae/200809.pdf> [December 2014 2014]

Bai, L., Wang, F., and Zhang, M. (2014) 'Research on Urban Rail Transit Network Command Center Information Platform'. *Procedia - Social and Behavioral Sciences* 138 (0), 350-357

Baird, A., O'Keefe, P., Westgate, K. N., and Wisner, B. (1975) *Towards an Explanation and Reduction of Disaster Proneness*. Occasional Paper edn. University of Bradford: University of Bradford Disaster Research Unit

Baird, M. E. (2010) *The "Phases" of Emergency Management - Background Paper*. Intermodal Freight Transportation institute (ITFI) University of Memphis: Vanderbilt Center for Transportation Research - VECTOR

Baker, G. W. and Chapman, D. W. (eds.) (1962) *Man and Society in Disaster.* New York, US: Basic Books

Bangham, G. and Shah, S. (2012) *The National Security Council and the Prime Minister*. University of Cambridge: The Wilberforce Society

Banks, M. and Zeitlyn, D. (2015) *Visual Methods in Social Research* [online] 2nd edn. London,: SAGE Publications. available from <http://site.ebrary.com/lib/coventry/docDetail.action?docID=10076697&ppg=90;> [4th June 2015]

Banks, M. (2001) *Visual Methods in Social Research* [online] . London, GBR: SAGE Publications Ltd. (UK). available from <http://site.ebrary.com/lib/coventry/docDetail.action?docID=10076697&ppg=90> [7th August 2014]

Barbosa-de-Oliveira, A. and Dias-da-Silva, B. (eds.) (2010) *Anais Da V Conferencia Linguistica e Cognicao*. 'Modelling Connections between Linguistic Constructions and Conceptual Metaphors'. held N.D. at Santa Catarina Brasil. Sau Paulo, Brazil: Universidade Estadual Paulista

Barnard, F. R. (2014) *A Picture is Worth a Thousand Words - Phrase Finder [Online]* [online] available from <http://www.phrases.org.uk/meanings/a-picture-is-worth-a-thousand-words.html> [September 3rd 2014]

Barnett, H. (2015) *Northumbria Female Chief Constable in Misconduct Probe as "Bullied" Senior Police "Terrified" of Her* [online] available from <http://www.express.co.uk/news/uk/565474/Female-chief-constable-misconduct-probe-claims-police-terrified> [April 8th 2015]

Barter, N. (2011) *Metaphors that Facilitate Organisational Understanding: Reaching for the New and how Machine and Organism Metaphors do Not Enable Sustainable Development - CSEAR 2011: 10th Australasian Conference on Social and Environmental Accounting Research* [online] available from <http://www.utas.edu.au/__data/assets/pdf_file/0008/188432/barter.pdf> [June 15th 2015]

Bartkowiak-Theron, I. and Robyn-Sappy, J. (2012) 'The Methodological Identity of Shadowing in Social Science Research'. *Qualitative Research Journal* 12 (1), 7-16

Barton, A. H. (2005) 'Disaster and Collective Stress'. in *What is a Disaster?: New Answers to Old Questions*. ed. by Perry, R. W. and Quarantelli, E. L. Philadelphia US: Xlibris, 125-152

Barton, A. H. (1969) *Communities in Disaster: A Sociological Analysis of Collective Stress*. New York, US: Doubleday and Company

Basar, P. (2006) *An Introduction to Ancient Combat*.: Wildfire

Bass, B. M. (1985) *Leadership and Performance Beyond Expectations*. New York: The Free Press

Bateman, I. J. and Mawby, J. (2004) 'First Impressions Count: Interviewer Appearance and Information Effects in Stated Preference Studies'*. Ecological Economics* 49 (1), 45-47

Bea, K. (2010) *Federal Stafford Act Disaster Assistance: Presidential Declarations, Eligible Activities, and Funding - CRS Report for Congress - March 16, 2010*. Washington D.C. US: Congressional Research Service

Bea, K. (2007) *Federal Emergency Management Policy Changes After Hurricane Katrina: A Summary of Statutory Provisions*. Washington D.C. US: Congressional Research Service

Bea, K. (2005) *Federal Stafford Act Disaster Assistance: Presidential Declarations, Eligible Activities, and Funding - CRS Report for Congress - August 29, 2005*. Washington D.C. US: Congressional Report Service

Bearman, C., Grunwald, J. A., Brooks, B. P., and Owen, C. (2015) 'Breakdowns in Coordinated Decision Making at and Above the Incident Management Team Level: An Analysis of Three Large Scale Australian Wildfires'*. Applied Ergonomics* 47 (0), 16-25

Bechhofer, F. and Paterson, L. (2001) *Principles of Research Design in the Social Sciences*. 2nd edn. London: Routledge

Beck, E. C. (1979) 'The Love Canal Tragedy'*. Environmental Protection Agency Journal* 17, 17-20

Beckett, M. (2000) *Modernising Government in Action: Realising the Benefits of Y2K*. London: H.M. Government

Bell, J. (2010) *Doing Your Research Project: A Guide for First-Time Researchers in Education, Health and Social Science*. 5th edn. Maidenhead, Berkshire, England: Open University Press

Bellini, P., Boncinelli, S., Grossi, F., Mangini, M., Nesi, P., and Sequi, L. (2013) 'Mobile Emergency, an Emergency Support System for Hospitals in Mobile Devices: Pilot Study.'*. JMIR Research Protocols* 2 (1), 1-12

Bendix, R. (2001) *Managerial Ideologies in the Course of Industrialization*. New Jersey, US: Transaction Publishers

Bennis, W., Goleman, D., and O'Toole, J. (2008) *Transparency: How Leaders Create a Culture of Candor*. Chichester, UK: Wiley

Benton, M. J. (1996) 'Dinosaur Extinction and the End of an Era'*. Trends in Ecology & Evolution* 11 (10), 442

Berger, J. (2008) *Ways of Seeing*. London: Penguin

Berger, P. L. and Luckmann, T. (1967) *The Social Construction of Reality: A Treatise in the Sociology of Knowledge*. London: Penguin Books

Bergman, J. (2008) 'Disaster: A Useful Category of Historical Anaysis'*. History Compass* 6 (3), 934-946

Berkes, F. and Ross, H. (2013) 'Community Resilience: Towards an Integrated Approach'. *Society and Natural Resources* 26 (1), 5-20

Bernstein, M. A. (1987) *The Great Depression: Delayed Recovery and Economic Change in America, 1929-1939*. Cambridge, UK: Cambridge University Press

Bernstein, S. (2015) *California Governor Declares in Response to San Bernardino Attack* [online] available from <http://www.reuters.com/article/us-california-shooting-emergency-idUSKBN0U202620151219> [January 11th 2016]

Best, J. (2002) 'Constructing the Sociology of Social Problems: Spector and Kitsuse Twenty-Five Years Later'. *Sociological Forum* 17 (4), 699-706

Bhaskar, R. (1989) *Reclaiming Reality: A Critical Introduction to Contemporary Philosophy*. London: Verso

Bhaskar, R. (1975) *A Realist Theory of Science*. London: Verso

Bigley, G. A. and Roberts, K. H. (2001) 'The Incident Command System: High-Reliability Organizing for Complex and Volatile Task Environments'. *Academy of Management Journal* 44 (6), 1281-1299

Billups, F. D. (2011) 'Exploring Organizational Culture through Metaphor Analysis'. *The NERA Researcher* 49 (2), 22-23

Bimson, K., Slim, A., and Heileman, G. L. (eds.) (2014) *International Conference on Semantic Computing*. 'Find-to-Forecast Process: An Automated Methodology for Situation Assessment'. held 16th-18th June at Newport Beach, California, US. NEW YORK,US: IEEE

Birkland, T. A. (2009) 'Disasters, Catastrophes, and Policy Failure in the Homeland Security Era'. *Review of Policy Research* 26 (4), 423-438

Bissell, R. (ed.) (2013) *Preparedness and Response for Catastrophic Disasters.* 1st edn. Boca Raton, Florida, US: CRC Press

Blaikie, N. (2004a) 'Interpretivism'. in *The SAGE Encyclopaedia of Social Science Research Methods - Online*. ed. by Lewis-Beck, M. S., Bryman, A., and Liao, T. F. http://srmo.sagepub.com/view/the-sage-encyclopedia-of-social-science-research-methods/n442.xml: SAGE Publishing

Blaikie, N. (2004b) 'Retroduction'. in *The SAGE Encyclopaedia of Social Science Research Methods*. ed. by Lewis-Beck, M. S., Bryman, A., and Liao, T. F. Thousand Oaks CA: SAGE Publishing

Blaikie, P. M. and Wisner, B. (2004) *At Risk: Natural Hazards, People's Vulnerability, and Disasters*. 2nd edn. London UK: Routledge

Blanchard, W. (2006) *Select Emergency Management Terms and Related Definitions* [online] available from <http://training.fema.gov/EMIWeb/edu/docs/hazdem/Appendix%20-%20Select%20EM-Related%20Terms%20and%20Definitions.doc> [October 6th 2014]

Boersma, K., Comfort, L., Groenendaal, J., and Wolbers, J. (2014) 'Editorial: Incident Command Systems: A Dynamic Tension among Goals, Rules and Practice'. *Journal of Contingencies & Crisis Management* 22 (1), 1-14

Boghossian, P. A. (2001) 'What is Social Construction?'. *Times Literary Supplement* New Essays on the A Priori (Knowledge of Logic)

Bogue, R. L. (2005) *USE S.M.A.R.T. Goals to Launch Management by Objective Plan* [online] available from <http://www.techrepublic.com/article/use-smart-goals-to-launch-management-by-objectives-plan/#.> [April 30th 2014]

Boin, A. (2005) 'An Interpretation of Disaster in Terms of Changes in Culture, Society and International Relations'. in *What is a Disaster?: New Answers to Old Questions*. ed. by Perry, R. W. and Quarantelli, E. L. Philadelphia US: Xlibris, 153-172

Borodzicz, E. P. (2004) 'The Missing Ingredient is the Value of Flexibility'. *Simulation and Gaming* 35 (3), 414-426

Bosworth, R. (2011) *What if Specialists - how to Keep Sane and Keep the Plates Spinning* [online] available from <http://www.whatifspecialist.com/2011/11/how-to-keep-sane-and-keep-the-plates-spinning/> [March 14th 2016]

Bowden, M. J., Haas, J. E., and Kates, R. W. (1977) *Reconstruction Following Disaster*. Cambridge, Massachusetts, US: Massachusetts Institute of Technology Press

Brace, I. (2008) *Questionnaire Design: How to Plan, Structure and Write Survey Material for Effective Market Research*. 2nd edn. London UK: Kogan Page Limited

Brackett, H. J. (ed.) (2008) *Integrated Communications, Navigation and Surveillance Conference*. 'Emergency Management Operations Control System'. held 5th-7th May at Bethesda, Maryland, US. New York, US: IEEE

Brannen, J. (N.D.) *Mixed Methods Research: A Discussion Paper*. http://eprints.ncrm.ac.uk/89/1/MethodsReviewPaperNCRM-005.pdf edn. University of London: National Centre for Research Methods

Brassett, J. and Vaughan-Williams, N. (2013) 'The Politics of Resilience from a Practitioner's Perspective: An Interview with Helen Braithwaite OBE'. *Politics* 33 (4), 229-239

Bratain, V. (2014) 'Defining the Concepts of Organization, Economic Organization and Stabilizer from the Perspective of Complex Systems'. *Procedia - Economics and Finance* 16 (IECS), 540-547

Breimyer, P. W. (2011) *Next Generation Incident Command System*. https://www.ll.mit.edu/publications/technotes/TechNote_NICS.pdf edn. Lincoln Laboratory - Massachusetts Institute of Technology: Tech Notes

Bremmer, J. N. (2008) *Greek Religion and Culture, the Bible and the Ancient Near East*. Leiden: Leiden : BRILL

Brennan, M. A., Barnett, R. V., and Flint, C. G. (2005) 'Community Volunteers: The Frontline of Disaster Response'. *The International Journal of Volunteer Administration* 23 (4), 52-56

Brewer, J. (2005) *Ethnography*. Buckingham - Philadelphia: Open University Press

Brewer, N. and Williams, K. D. (eds.) (2005) *Psychology and Law: An Empirical Perspective.* New York, NY, USA: Guilford Press

Bridgend County Borough Council (2013) *What is a Major Incident/Disaster?* [online] available from <http://www1.bridgend.gov.uk/services/emergency-planning/what-is-a-major-incident-disaster.aspx> [8th October 2014 2014]

British Academy of Management (2015a) *Special Interest Groups - Organizational Transformation, Change and Development* [online] available from <https://www.bam.ac.uk/sigs-organizational-transformation-change-and-development> [14th July 2015]

British Academy of Management (2015b) *Special Interest Groups - Leadership and Leadership Development* [online] available from <https://www.bam.ac.uk/sigs-leadership-and-leadership-development> [14th July 2015]

British Army (2015) *Training* [online] available from <http://www.army.mod.uk/training_education/24454.aspx> [April 4th 2015]

British Broadcasting Corporation (2012a) *Storm Sandy Causes Severe Flooding in Eastern US* [online] available from <http://www.bbc.co.uk/news/world-us-canada-20133158> [October 8th 2014]

British Broadcasting Corporation (2012b) *Cleveland Police Chief Sean Price Sacked After Inquiry* [online] available from <http://www.bbc.co.uk/news/uk-19840069> [April 8th 2015]

British Broadcasting Corporation (2010) *BBC News - Haiti Earthquake: Thousands Feared Dead* [online] available from <http://news.bbc.co.uk/1/hi/8456819.stm> [October 8th 2014]

British Broadcasting Corporation (2001) *The Day that Shook the World: Understanding September 11th*. London: BBC Worldwide Ltd

Britten, N. (1995) 'Qualitative Research: Qualitative Interviews in Medical Research'. *British Medical Journal* 311 (6999), 251-253

Britton, N. R. (2005) 'Dog Or Demon?'. in *What is a Disaster?: New Answers to Old Questions*. ed. by Perry, R. W. and Quarantelli, E. L. Philadelphia US: Xlibris, 113-124

Britton, N. R. (1999) 'Whither the Emergency Manager?'. *International Journal of Mass Emergencies and Disasters* 17 (2), 223-235

Britton, N. R. (1988) 'Organized Behaviour in Disaster: A Review Essay'. *International Journal of Mass Emergencies and Disasters* 6 (3), 363-395

Brooksbank, M. (2013) *Interpretivism and Social Constructionism* [online] available from <http://prezi.com/fjzo3ya99rp4/interpretivism-and-social-constructivist/> [June 23rd 2014]

Browder, C. (2012) *Three State Employees Fired After Nepotism Reports* [online] available from <http://www.wral.com/news/local/wral_investigates/story/11034072/> [April 8th 2015]

Browning, R. (2005) 'New Views on the Silesian Wars'. *The Journal of Military History* 69 (2), 521-534

Brutus, S., Aguinis, H., and Wassmer, U. (2013) 'Self-Reported Limitations and Future Directions in Scholarly Reports: Analysis and Recommendations'. *Journal of Management* 39 (1), 48-75

Bryman, A. and Bell, E. (2015) *Business Research Methods*. 4th edn. Oxford, UK: Oxford University Press

Bryman, A. (2012) *Social Research Methods*. 4th edn. Oxford: Oxford University Press

Bryman, A. and Bell, E. (2011) *Business Research Methods*. 3rd edn. Oxford: Oxford University Press

Buck, D. A., Trainor, J. E., and Aguirre, B., E. (2006) 'A Critical Evaluation of the Incident Command System and NIMS'. *Journal of Homeland Security and Emergency Management* 3 (3), 1-27

Burby, R. J. (2006) 'Hurricane Katrina and the Paradoxes of Government Disaster Policy: Bringing about Wise Governmental Decisions for Hazardous Areas'. *The Annals of the American Academy of Political and Social Science* 604 (1), 171-191

Burge, S. (2015) *Soft Systems Methodology* [online] available from <http://www.burgehugheswalsh.co.uk/Uploaded/1/Documents/Soft-Systems-Methodology.pdf> [February 16th 2016]

Burke, P. J. and Stets, J. E. (1998) *Identity Theory and Social Identity Theory*. Session Paper edn. San Francisco: American Sociological Association

Burnard, P., Gill, P., Treasure, E., and Chadwick, B. (2008) 'Analysing and Presenting Qualitative Data'. *British Dental Journal* 204 (Online), 429-432

Burns, R. B. (2000) *An Introduction to Research Methods*. 4th edn. London: SAGE

Burton, I., Kates, R., and White, G. F. (1978) *The Environment as Hazard*. 1st edn. London, UK: Guilford Press

Burton, M. L. and Hick, M. J. (2005) *Hurricane Katrina: Preliminary Estimates of Commercial and Public Sector Damages*. Marshall University: Center of Economic and Business Research

Burton, N. (2008) *Town Centre Hotel Gutted in Major Fire - the Northern Echo Online* [online] available from <http://www.thenorthernecho.co.uk/news/3595963.Town_centre_hotel_gutted_in_major_fire/> [http://www.thenorthernecho.co.uk/news/3595963.Town_centre_hotel_gutted_in_major_fire/ 2016]

Cabinet Office (2015) *National Risk Register of Civil Emergencies (NRR)* [online] available from <https://www.gov.uk/government/publications/national-risk-register-for-civil-emergencies-2015-edition> [January 27th 2015]

Cabinet Office (2014a) *National Security Council* [online] available from <https://www.gov.uk/government/organisations/national-security/groups/national-security-council> [November 3rd 2014]

Cabinet Office (2014b) *Preparation and Planning for Emergencies: The National Resilience Capabilities Programme* [online] available from <https://www.gov.uk/preparation-and-planning-for-emergencies-the-capabilities-programme> [November 4th 2014]

Cabinet Office (2013) *The Role of Local Resilience Forums: A Reference Document* [online] available from <https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/62277/T

he_role_of_Local_Resilience_Forums-_A_reference_document_v2_July_2013.pdf> [6th November 2014]

Cabinet Office (2011a) *The Civil Contingencies Act Enhancement Programme: Project Initiation Document* [online] available from <https://www.gov.uk/government/publications/civil-contingencies-act-enhancement-programme-programme-initiation-document> [November 6th 2014]

Cabinet Office (2011b) *Civil Contingencies Act Enhancement Programme: Phase Two Consultation on Revised Chapters of Emergency Preparedness* [online] available from <https://www.gov.uk/government/news/civil-contingencies-act-enhancement-programme-phase-2-consultation-on-revised-chapters-of-emergency-preparedness> [November 6th 2014]

Cabinet Office (2009) *Civil Contingencies Act Enhancement Programme Briefing Pack* [online] available from <https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/60883/civil-contingencies-act-ep-briefing.pdf> [November 6th 2014]

Cabinet Office (2004) *Dealing with Disaster - Revised Third Edition* [online] available from <http://webarchive.nationalarchives.gov.uk/20050523205851/ukresilience.info/contingencies/dwd/index.htm> [October 7th 2014]

California Governor's Office of Emergency Services (2011) *About Cal OES* [online] available from <http://www.calema.ca.gov/LandingPages/Pages/About-CalOES.aspx> [January 2nd 2015]

Cameron, R. (2011) 'Mixed Methods Research: The Five Ps Framework'. *The Electronic Journal of Business Research Methods* 9 (2), 96-108

Cancer Research Institute (2015) *Cancer Immunotherapy Timeline* [online] available from <http://www.cancerresearch.org/our-strategy-impact/timeline-of-progress/timeline-detail> [March 14th 2016]

Capozza, D. (2000) *Social Identity Processes Trends in Theory and Research*. London, UK: SAGE Publications

Carr, J. and Jensen, J. (2015) 'Explaining the Pre-Disaster Integration of Community Emergency Response Teams (CERTs)'. *Natural Hazards* 77 (3), 1551-1571

Carr, J. A. (2014) *Pre-Disaster Integration of Community Emergency Response Teams within Local Emergency Management Systems*. [online] Masters of Science thesis or dissertation. Fargo, North Dakota, US: North Dakota State University

Carr, L. J. (1932) 'Disaster and the Sequence-Pattern Concept of Social Change'. *The American Journal of Sociology* 38 (2), 207-218

Carter, A., Deutch, J., and Zelikow, P. (1998) 'Catastrophic Terrorism - Tackling the New Danger'. *Foreign Affairs* 77 (6), 80-94

Cartledge, P. (2003) *The Spartans: An Epic History*. New York: Pan Books

Castleden, R. (1998) *Atlantis Destroyed* [online] . London, GBR: Routledge. available from <http://site.ebrary.com/lib/coventry/docDetail.action?docID=10056174&ppg=1> [9th October 2014]

CDRSS (2006) *Facing Hazards and Disasters: Understanding Human Dimensions - Committee on Disaster Research in the Social Sciences;*. Washington D.C., US: National Academy of Sciences

Center for Disaster Philanthropy (2014) *The Stafford Act* [online] available from <http://disasterphilanthropy.org/the-stafford-act/> [December 18th 2014]

Centre for Research on the Epidemiology of Disasters (2009) *About* [online] available from <http://www.cred.be/about> [September 20th 2014]

Chan, S. (ed.) (2001) *EDS.83 Rsearch Seminar in Engineering Systems*. 'Complex Adaptive Systems'. held 31st October at massachusettsInstitute of Technology. Online: MIT, Massachusetts, US

Chandler, D. (2014) *Semiotics for Beginners* [online] available from <http://visual-memory.co.uk/daniel/Documents/S4B/sem01.html> [June 4th 2015]

Chang, H. (2015) *An Analysis of the Incident Command System*. [online] Doctoral thesis or dissertation. Disaster Research Center: University of Delaware

Chang, H. (2007) *EMS: A Comparison between Taiwan and the United States*. http://www.fireengineering.com/articles/print/volume-160/issue-11/features/ems-a-comparison-between-taiwan-and-the-united-states.html edn. Online: Fire Engineering Magazine

Chapman, D. W. (1962) 'A Brief Introduction to Contemporary Disaster Research'. in *Man and Society in Disaster*. ed. by Baker, G. W. and Chapman, D. W. New York, US: Basic Books, 3-22

Charman, S. (2013) *Black Humour Bands Police and Ambulance Crews*. [7th February 2013 2013] available from <http://www.port.ac.uk/uopnews/2013/02/07/black-humour-bonds-police-and-ambulance-crews/> [8th Aril 2015]

Chaudhury, K. S., Nibedita, A., and Mishra, P. M. (2012) 'Command and Control in Disaster Management'*. International Journal of Computer Science Issues* 9 (4), 256-259

Chiang, H. (2006) 'Disaster Semiotics'*. Sign Systems Studies* 34 (1), 215-230

Christ, C. P. (2012) *Candles in the Dark* [online] available from <http://feminismandreligion.com/2012/12/17/solstice-comes-but-once-a-year-by-carol-p-christ/candles-in-the-dark/> [March 14th 2016]

Christensen, L. T. and Cornelissen, J. (2015) 'Organizational Transparency as Myth and Metaphor'*. European Journal of Social Theory* 18 (2), 132-149

Chrzanaowska, J. (2002) *Qualitative Market Research, Volume 2: Interviewing Groups and Individuals in Qualitative Market Research* [online] . London UK: SAGE Publications, Incorporated. available from <http://site.ebrary.com/lib/coventry/docDetail.action?docID=10256963&ppg=62> [21st July 2014]

Civil Contingencies Secretariat (2013) *The Civil Protection Lexicon*. 2.1.1 edn. London: Cabinet Office

Clegg, S. R. and Hardy, C. (1999) *Studying Organization Theory and Method*. London, UK: SAGE Publications

Cleveland, C. J. (2010) *Deepwater Horizon Oil Spill*. http://www.eoearth.org/view/article/51cbf0267896bb431f6a0797/ edn. Online: Encyclopedia of the Earth

Clifford, R. A. (1956) *The Rio Grande Flood; a Comparative Study of Border Communities on Disaster* [online] available from <https://archive.org/stream/riograndefloodco00clifrich#page/n0/mode/2up> [February 1st 2016]

Coetzee, C. and van Niekerk, D. (2012) 'Tracking the Evolution of the Disaster Management Cycle: A General System Theory Approach'*. Jamba, Journal of Disaster Risk Studies* 4 (1), 1-9

Cogan, C. (2003) 'Desert One and its Disorders'*. Journal of Military History* 67 (1), 201-216

Cohen, D. and Crabtree, B. (2008) *Robert Wood Johnson Foundation Qualitative Research Guidelines Project - Unstructured Interviews* [online] available from <http://www.qualres.org/HomeUnst-3630.html> [July 30th 2014]

Cohen, D., Sevdalis, N., Patel, V., Taylor, M., Lee, H., Vokes, M., Heys, M., Taylor, D., Batrick, N., and Darzi, A. (2013a) 'Tactical and Operational Response to Major Incidents: Feasibility and Reliability of Skills Assessment using Novel Virtual Environments'*. Resuscitation* 84 (7), 992-998

Cohen, D., Sevdalis, N., Taylor, D., Kerr, K., Heys, M., Willett, K., Batrick, N., and Darzi, A. (2013b) 'Emergency Preparedness in the 21st Century: Training and Preparation Modules in Virtual Environments'*. Resuscitation* 84 (1), 78-84

Cohen, W. J. and Boyer, E., F. (1951) 'Federal Civil Defense Act of 1950: Summary and Legislative History'*. Bulletin - House Report* 3209 (9798), 11-16

Cole, D. (2000) *The Incident Command System: A 25-Year Evaluation by California Practitioners* [online] available from <http://www.usfa.fema.gov/pdf/efop/efo31023.pdf> [April 10th 2015]

Cole, J. (2010) *Interoperability in a Crisis 2: Human Factors and Organisational Processes - Occasional Paper*. Whitehall, London: Royal United Services Institute

Cole, J. (2006) 'A "Shiite Crescent"? the Regional Impact of the Iraq War'*. Current History* 105 (687), 20-26

Coles, E. and Buckle, P. (2004) 'Developing Community Resilience as Foundation for Effective Disaster Recovery'*. Australian Journal of Emergency Management* 19 (4), 6-15

Coles, J. B., Zhuang, J., and Yates, J. (2012) 'Case Study in Disaster Relief: A Descriptive Analysis of Agency Partnerships in the Aftermath of the January 12th, 2010 Haitian Earthquake'*. Socio-Economic Planning Sciences* 46 (1), 67-77

College of Policing (2015a) *Multi-Agency Gold Incident Command (MAGIC) Training* [online] available from <http://www.college.police.uk/What-we-do/Learning/Curriculum/Operations/Pages/Multi-Agency-Gold-Incident-Command-(MAGIC)-Training.aspx> [July 1st 2015]

College of Policing (2015b) *National Decision Model* [online] available from <https://www.app.college.police.uk/app-content/national-decision-model/the-national-decision-model/> [July 14th 2015]

College of Policing (2014) *Response and Recovery Processes* [online] available from <https://www.app.college.police.uk/app-content/civil-contingencies/emergency-procedures/response-and-recovery/#inner-cordon> [July 15th 2015]

Colorado Division of Emergency Management and Homeland Security (2011) *Multi-Agency Coordination Group* [online] available from <http://www.coemergency.com/2011/03/multi-agency-coordination-group.html> [31st March 2015]

Comerio, M. (1998) *Disaster Hits Home: New Policy for Urban Housing Recovery*. Berkley, CA, US: University of California Press

Comfort, L. K. (2007) 'Crisis Management in Hindsight: Cognition, Communication, Coordination, and Control'. *Public Administration Review* 67 (S1), 189-197

Comfort, L. K. (2005) 'Risk, Security, and Disaster Management'. *Annual Review of Political Science* 8 (June 2005), 335-336

Comfort, L. K. (1994) 'Risk and Resilience: Inter-Organizational Learning Following the Northridge Earthquake of 17 January 1994'. *Journal of Contingencies & Crisis Management* 2 (3), 157-170

Committee on Homeland Security and Governmental Affairs (2006) *Hurricane Katrina: A Nation Still Unprepared - Special Report*. Washington D.C.: 109th US Congress

Cooper, H., M. (1988) 'Organizing Knowledge Synthesis: A Taxonomy of Literature Reviews'. *Knowledge in Society* 1 (1), 104-126

Cooper, H. (2011) 'Tiers Shed as Regional Government Offices Disappear'. *The Guardian* 29th March 2011: Online

Copeland, T. (2007) *Fool Me Twice Intelligence Failure and Mass Casualty Terrorism*. Leiden, Boston, US: Martinus Nijhoff Publishers

Coppola, D. P. (2006) *Introduction to International Disaster Management*. 2nd edn. Burlington, MA, US: Elsevier Science

Corbin, J. (2003) 'The Unstructured Interactive Interview: Issues of Reciprocity and Risks when Dealing when Dealing with Sensitive Topics'. *Qualitative Inquiry* 9 (3), 335-354

Cornelissen, J. P. and Kafouros, M. (2008a) 'Metaphors and Theory Building in Organisation Theory: What Determines the Impact of a Metaphor on Theory?'. *British Journal of Management* 19 (4), 365-379

Cornelissen, J. P. and Kafouros, M. (2008b) 'The Emergent Organization: Primary and Complex Metaphors in Theorizing about Organizations'. *Organizations Studies* 29 (7), 957-978

Cornell University Law School (2014) *Federalism - Legal Information Institute* [online] available from <http://www.law.cornell.edu/wex/federalism> [December 17th 2014]

Corporation for National and Community Service (2014) *About FEMA Corps* [online] available from <http://www.nationalservice.gov/programs/americorps/fema-corps> [January 7th 2015]

Cortez, M. (2014) *We Won't Solve Biblical Literacy with Bible Trivia* [online] available from <http://marccortez.com/2014/03/04/we-wont-solve-biblical-literacy-with-bible-trivia/> [March 14th 2016]

Cote, J. E. and Levine, C. G. (2002) *Identity, Formation, Agency and Culture: A Social Psychological Synthesis*. Mahwah, New Jersey, US: Taylor and Francis

Couttie, B. (2014a) *The Case of the Toppling Tug Part 1 - the Maritime Accident Casebook* [online] available from <http://maritimeaccident.org/library2/the-case-of-the-toppling-tug/> [27th January 2016]

Couttie, B. (2014b) *The Case of the Toppling Tug Part 2 - the Maritime Accident Casebook* [online] available from <http://maritimeaccident.org/library2/the-case-of-the-toppling-tug/the-case-of-the-toppling-tug-part-2/> [27th January 2016]

Coventry University (2014) *Centre for Disaster Management and Hazards Research* [online] available from <http://www.coventry.ac.uk/research/research-directory/environmental/centre-for-disaster-management/> [October 22nd 2014]

Coventry University IT Services (2012) *Remote Desktop Connection (Windows)* [online] available from <https://curve.coventry.ac.uk/cu/file/7f47c8ee-c9b3-1ac8-b276-a89d0ba15a34/1/RDC%20v6.pdf> [September 3rd 2014]

Crabtree, V. (2007) *Natural Evil such as Earthquakes - Evidence that God is Not Good*. [3rd December 2007 2007] available from <http://www.vexen.co.uk/religion/theodicy_naturalevil.html> [9th October 2014]

Crager, D. (2014) *Major Incidents: Interagency Coordination Critical in Oso, Wash. Mudslide Rescue Effort*. http://www.jems.com/article/swiftwater-rescue/interagency-coordination-critical-rescue edn. Online: Journal of Emergency Medical Services

Craven, J. A., Hollis, G., and Richardson, D. B. (2011) 'A Light-Hearted Look at Patient Overcrowding: The Extended Emergency Department Cardiology Analogy Model (e-EDCAM)'. *EMA - Emergency Medicine Australasia* 23 (4), 512-513

Cresswell, J. W. and Plano Clark, V. L. (2011) *Designing & Conducting Mixed Methods Research*. 2nd edn. London, UK: Sage Publications

Cresswell, J. W. (1998) *Qualitative Inquiry and Research Design: Choosing among Five Traditions*. London UK: SAGE Publications

Crichton, M. T., Lauche, K., and Flin, R. H. (2005) 'Incident Command Skills in the Management of an Oil Industry Incident: A Case Study'. *Journal of Contingencies and Crisis Management* 13 (3), 116-128

Cronholm, S. and Hjalmarsson, A. (2011) 'Experiences from Sequential use of Mixed Methods'. *The Electronic Journal of Business Research Methods* 9 (2), 87-95

Crotty, M. (1998) *The Foundations of Social Research: Meaning & Perspective in the Research Process*. 1st edn. London: SAGE Publications

Cumbria Resilience (2013) *Cumbria Resilience Forum Strategic Plan 2010-13* [online] available from <http://www.cumbria.gov.uk/eLibrary/Content/Internet/536/647/40521145337.pdf> [November 6th 2014]

Curka, P. A., Pepe, P. E., G inger, V. F., Sherrard, R. C., Ivy, M. V., and Zachariah, B. S. (1993) 'Emergency Medical Services Priority Dispatch'. *Annals of Emergency Medicine* 22 (11), 1688-1695

Curnin, S., Owen, C., Paton, D., and Brooks, B. (2015) 'A Theoretical Framework for Negotiating the Path of Emergency Management Multi-Agency Coordination'. *Applied Ergonomics* 47, 300-307

Curnin, S. and Owen, C. (2014) 'Spanning Organizational Boundaries in Emergency Management'. *International Journal of Public Administration* 37 (5), 259-270

Currivan, D. B. (2008) 'Conversational Interviewing Methods'. in *Encyclopaedia of Survey Research*. ed. by Lavrakas, P. J. Thousand Oaks, CA: Sage Publications

Dacin, M. T., Goodstein, J., and Scott, W. R. (2002) 'Institutional Theory and Institutional Change: Introduction to the Special Research Forum'. *Academy of Management Journal* 45 (1), 45-56

Daily Mail (2012) *Ian Bell found: Police Find Body of Missing Boy, 8, who disappeared after He Fell into a River* [online] available from <http://www.dailymail.co.uk/news/article-2140460/Ian-Bell-Police-body-missing-boy-8-River-Wear.html> [January 27th 2016]

Davis, T. (2005) *A Failure of Initiative: Final Report of the Select Bipartisan Committee to Investigate the Preparation and Response to Hurricane Katrina*. Washington DC, US: House of Representatives

Davis, T. C. (2007) *Stages of Emergency: Cold War Nuclear Defense*. Durham N.C.: Duke University Press

Deignan, A. (2005) *Metaphor and Corpus Linguistics*. 1st edn. Amsterdam: John Benjamins Publishing Company

Denef, S., Bayerl, P. S., and Kaptein, N. A. (eds.) (2013) *Conference on Human Factors in Computing Systems - Proceedings*. 'Social Media and the Police-Tweeting Practices of British Police Forces during the August 2011 Riots'. held 27th April-3rd May at Paris, France. Online: CHI

Denscombe, M. (2010) *The Good Research Guide for Small-Scale Social research Projects*. 4th edn. Maidenhead, England: McGraw-Hill

Department for Food and Rural Affairs (2013) *Daily Air Quality Index* [online] available from <http://uk-air.defra.gov.uk/air-pollution/daqi> [October 8th 2014]

Department of Homeland Security (2015) *FY 2015 Budget in Brief* [online] available from <http://www.dhs.gov/sites/default/files/publications/FY15-BIB.pdf> [February 14th 2016]

Department of Homeland Security (2014a) *History* [online] available from <http://www.dhs.gov/history> [January 5th 2015]

Department of Homeland Security (2014b) *Who Joined DHS* [online] available from <http://www.dhs.gov/who-joined-dhs> [January 5th 2015]

Department of Homeland Security (2011) *The National Disaster Recovery Framework: Strengthening Disaster Recovery for the Nation* [online] available from <http://www.fema.gov/media-library-data/20130726-1820-25045-5325/508_ndrf.pdf> [February 20th 2014]

Department of Homeland Security (2010) *Management Advisory Report: FEMA's IMAT Program*. Washington D.C. US: Office of Inspector General

Department of Homeland Security (2008) *The National Incident Management System* [online] available from <http://www.fema.gov/pdf/emergency/nims/NIMS_core.pdf> [29th July 2013]

Destro, L. and Holguin-Veras, J. (2011) 'Material Convergence and its Determinants: Case of Hurricane Katrina'. *Transportation Research Record: Journal of the Transportation Research Board* 2234, 14-21

Devon, Cornwall, Isles of Scilly Local Resilience Forum (N.D.) *Frequently Asked Questions* [online] available from <https://www.dcisprepared.org.uk/faq> [November 6th 2014]

DiCicco-Bloom, B. and Crabtree, B. F. (2006) 'The Qualitative Research Interview'. *Medical Education* 40 (4), 314-321

Dick, P. and Nadin, S. J. (2006) 'Reproducing Gender Inequalities? A Critique of Realist Assumptions Underpinning Personnel Selection Research and Practice'. *Journal of Occupational and Organizational Psychology* 79 (3), 481-498

Diener, E. and Crandall, R. (1978) *Ethics in Social and Behavioral Research* . Chicago, USA: University of Chicago Press

Dillon, B. (2014) *Blackstone's Emergency Planning, Crisis, and Disaster Management*. 2nd edn. Oxford, UK: Oxford University Press

Dinwiddie, R., Lamb, S., and Reynolds, R. (2011) *Violent Earth*. London, UK: Dorling Kindersley

Disaster Management Institute of Southern Africa (2014) *Building Disaster Resilience is Everybody's Business* [online] available from <http://www.disaster.co.za> [28th July 2014]

Disasterium (2013) *Information about Disasters* [online] available from <http://www.disasterium.com/> [September 16th 2014]

Disha Management (2015) *Theory of Pre-Classical Approach to Management* [online] available from <http://www.yourarticlelibrary.com/management/theory-of-pre-classical-approach-of-management/44884/> [April 15th 2015]

Diversity Preparedness - Drexel University (2015) *The National Resource Center on Advancing Preparedness for Culturally Diverse Communities* [online] available from <http://www.diversitypreparedness.org/browse-resources/resource-type/resources-professionals/> [April 4th 2015]

Docherty, J. S. (2001) *Revisiting the War Metaphor - Sept. 25 2001* [online] available from <http://www.emu.edu/cjp/publications/beyond-september-11th/2001/revisiting-the-war-metaphor/> [16th June 2015 2015]

Dombrowsky, W. R. (1998) 'Again and again: Is Disaster what we Call a "Disaster"?'. in *What is Disaster?: Perspectives on the Question*. ed. by Quarantelli, E. L. London UK: Routledge, 19-30

Downe, J. and Asworth, R. (2013) *Developing a Culture of Collaborative Scrutiny: An Evaluation of Practice and Potential*. Centre for Local & Regional Government Research Cardiff Business School: University of Cardiff

Downer, J. (2010) *Anatomy of Disaster: Why some Accidents are Unavoidable - Centre for Analysis of Risk and Regulation Discussion Paper no: 61* [online] available from <http://eprints.lse.ac.uk/36542/1/Disspaper61.pdf> [May 27th 2015]

Drabek, T. E. (ed.) (2004) *Emergency Management Higher Education Conference*. 'Theories Relevant to Emergency Management Versus a Theory of Emergency Management'. held June at Emmitsburg, Maryland, US. https://training.fema.gov/emiweb/downloads/thomas%20drabek%20-%20theories%20revelant.doc: National Emergency Training Center

Drabek, T. E. and McEntire, D. A. (2002) 'Emergent Phenomena and Multiorganizational Coordination in Disasters: Lessons from the Research Literature'. *International Journal of Mass Emergencies and Disasters* 20 (2), 197-224

Drabek, T. E. (1991) 'The Evolution of Emergency Management'. in *Emergency Management : Principles and Practice for Local Government*. ed. by Drabek, T. E. and Hoetmer, G. J. Washington, D.C.: International City Management Association, 3-29

Drabek, T. E. (1985) 'Managing the Emergency Response'. *Public Administration Review* 45 (Special Issue (Jan)), 85-92

Drabek, T. E., (1986) *Human System Responses to Disaster : An Inventory of Sociological Findings*. New York ; London: Springer-Verlag

Drabek, T. E. and Evans, J. (2007) 'Sociology, Disasters and Emergency Management: History, Contributions, and Future Agendas'. in *Disciplines, Disasters, and Emergency Management : The Convergence and Divergence of Concepts, Issues and Trends from the Research Literature*. ed. by McEntire, D. A. Springfield, Illinois, US: Charles C Thomas, 61-74

Drucker, P. (2011) *People and Performance*. Oxford: Routledge

Durham University (2014) *The Institute of Hazard, Risk and Resilience (IHRR)* [online] available from <https://www.dur.ac.uk/ihrr/> [September 11th 2014]

Dynes, R. R. (2004) 'Expanding the Horizons of Disaster Research'. *Natural Hazards Observer* 28 (4), 1-2

Dynes, R. R. (2000a) 'The Dialogue between Voltaire and Rousseau on the Lisbon Earthquake: The Emergence of a Social Science View'. *International Journal of Mass Emergencies and Disasters* 18 (1), 97-115

Dynes, R. R. (2000b) *Governmental Systems for Disaster Management*. Preliminary Paper # 300 edn. University of Delaware, Newark, US: E.L. Quarantelli Resource Collection (online)

Dynes, R. R. (1998) *Noah and Disaster Planning: The Cultural Significance of the Flood Story*. Preliminary Paper edn. Newark: E.L. Quarantelli Resource Collection (online)

Dynes, R. R. (1994) 'Community Emergency Planning: False Assumptions & Inappropriate Analogies'. *International Journal of Mass Emergencies and Disasters* 12 (2), 141-158

Dynes, R. R. (1993) 'Disaster Reduction: The Importance of Adequate Assumptions about Social Organizations'. *Sociological Spectrum* 13 (1), 175-192

Dynes, R. R. and Quarantelli, E. L. (1992) *The Place of the 1917 Explosion in Halifax Harbour in the History of Disaster Research: The Work of Samuel H. Prince - Preliminary Paper # 182*. Preliminary Paper # 182 edn. University of Delaware: Disaster Research Center

Dynes, R. R. (1988) 'Cross-Cultural International Research: Sociology and Disaster'. *International Journal of Mass Emergencies and Disasters* 6 (2), 101-129

Dynes, R. R., De Marchi, B., and Pelanda, C. (eds.) (1987) *Sociology of Disaster.* Milan, Italy: Franco Angeli

Dynes, R. R. (1983) 'Problems in Emergency Planning'. *Energy* (8), 8-9

Dynes, R. R. (1981) *Models of Emergency Planning: Contributions from the Social Sciences* [online] available from <http://www.eird.org/estrategias/pdf/eng/doc13423/doc13423-contenido.pdf> [July 2nd 2015]

Dynes, R. R., Quarantelli, E. L., and Kreps, G. A. (1981) *A Perspective on Disaster Planning - 3rd Edn*. University of Delaware: Disaster Research Center

Dynes, R. R. and Quarantelli, E. L. (1975) *The Role of Civil Defense in Disaster Planning*. The Ohio State University: Disaster Research Center

Dynes, R. R. (1973) *The Family and Community Context of Individual Reactions to Disaster*. Preliminary Paper #1 0 edn. University of Delaware, Newark, US: E.L. Quarantelli Resource Collection (online)

Dynes, R. R., Quarantelli, E. L., and Kreps, G. A. (1972) *A Perspective on Disaster Planning - Report no: 11*. Ohio State University, Columbus, Ohio, US: Disaster Research Centre

Dynes, R. R. (1970) *Organized Behavior in Disaster*. Lexington, MA, US: D.C. Health and Company

Dynes, R. R. and Quarantelli, E. L. (1968) *Group Behavior Under Stress: A Required Convergence of Organizations and Collective Behavior Perspectives*. Ohio State University: Disaster Research Center

Easterby-Smith, M., Thorpe, R., and Jackson, P. R. (2008) *Management Research*. 4th Edition edn. London: Sage

Economic and Social Research Council (2011) *The Research Ethics Guidebook: A Resource for Social Scientists*. Swindon: Economic & Social Research Council

Economic and Social Research Council (2006) *Framework for Research Ethics (FRE)*. Swindon: Economic & Social Research Council

Eidos Interactive (2007) *Tomb Raider Anniversary* [online] available from <www.tombraider.com> [9th October 2014]

Elkind, D. (N.D.) *Erik Erkison's Eight Ages of Man - Supplemental* [online] available from <https://www.pdx.edu/sites/www.pdx.edu.ceed/files/sscbt_EriksonsEightAgesofMan.pdf > [April 6th 2015]

Ellwood, T. and Philips, M. (2013) *Improving Efficiency, Interoperability and Resilience of our Blue Light Services: Occasional Report Published by the APPG HS (Session 2013-14)*. London: The All-Party Parliamentary Group on Homeland Security

Elwell, F. W. (2013) *Sociocultural Systems: Principles of Structure and Change*. EPub edn. Edmonton, Canada: Au Press, Athabasca University

Embassy of the United States (2015) *Law Enforcement Agencies in the US* [online] available from <http://london.usembassy.gov/rcpolice.html> [July 21st 2015]

Emergency Management Australia (1998) *Australian Emergency Management Glossary - Australian Emergency Manual Series - Manual 3* [online] available from <http://www.em.gov.au/Documents/Manual03-AEMGlossary.PDF> [September 23rd 2014]

Emergency Planning College (N.D.) *Library and Information Centre* [online] available from <http://www.epcollege.com/epc/knowledge-centre/library/> [September 2014 2014]

Empire State College (2014) *Analysis in Research Papers* [online] available from <http://www.esc.edu/online-writing-center/resources/research/research-paper/analysis-research-papers/> [August 28th 2014]

Enarson, E. (2007) 'Identifying and Addressing Social Vulnerabilities'. in *Emergency Management: Principles and Practice for Local Government*. ed. by Waugh, W. L. and Tierney, K. J. Washington D.C., USA: International City/County Management Association, 257-278

Environment Agency (2016) *Winter 2015 to 2016 Floods* [online] available from <https://www.gov.uk/government/news/north-west-england-floods-2015-government-response> [January 11th 2016]

Ereaut, G. (2002) *Qualitative Market Research, Volume 4 : Analysis in Interpretation in Qualitative Market Research* [online] . London, UK: SAGE Publications, Incorporated. available from <http://site.ebrary.com/lib/coventry/docDetail.action?docID=10256957&ppg=16> [28th August 2014]

Erickson, F. (1986) 'Qualitative Methods in Research on Teaching'. in *Handbook of Research on Teaching*. ed. by Wittrock, M. C. The University of Michigan: Macmillan, 119-161

European Commission (2015) *European Union Civil Protection Mechanism* [online] available from <http://ec.europa.eu/echo/what/civil-protection/mechanism_en> [March 10th 2015]

Evans, G. (2015a) *Vector Command Wins New Middle East Contract* [online] available from <http://www.vectorcommand.com/new-middle-east-contract/> [March 19th 2015]

Evans, M. (2015b) *Met Chief Accepts Force "may be Institutionally Racist"* [online] available from <http://www.telegraph.co.uk/news/uknews/crime/11655358/Met-chief-accepts-force-may-be-institutionally-racist.html> [July 1st 2015]

Exxon Valdez Oil Spill Trustee Council (N.D.) *Oil Spill Facts - Questions and Answers* [online] available from <http://www.evostc.state.ak.us/index.cfm?FA=facts.QA> [November 30th 2014]

Fairfax County (N.D.) *Explaining Federal, State and Local Government Responsibilities in Virginia* [online] available from <http://www.fairfaxcounty.gov/dmb/federal-state-local-government-responsibilities.pdf> [December 17th 2014]

Falkenrath, R. A. (2001) 'Problems of Preparedness - US Readiness for a Domestic Terrorist Attack'. *International Security* 25 (4), 147-151

Fasick, F., A. (1977) 'Some Uses of Untranscribed Tape Recordings in Survey Research'. *Public Opinion Quarterly* 41 (4), 549-552

Faulkner, B. (2001) 'Towards a Framework for Tourism Disaster Management'. *Tourism Management* 22 (2), 135-147

Federal Bureau of Investigation (N.D.) *Terror Hits Home - the Oklahoma City Bombing* [online] available from <http://www.fbi.gov/about-us/history/famous-cases/oklahoma-city-bombing> [December 22nd 2014]

Federal Emergency Management Agency (N.D.) *FEMA- Organizational Structure* [online] available from <http://www.fema.gov/organizational-structure> [August 20th 2014]

Federal Emergency Management Agency (2015a) *State Offices and Agencies of Emergency Management* [online] available from <https://www.fema.gov/state-offices-and-agencies-emergency-management> [January 2nd 2015]

Federal Emergency Management Agency (2015b) *Homeland Security Grant Program* [online] available from <https://www.fema.gov/fiscal-year-2015-homeland-security-grant-program> [January 2nd 2016]

Federal Emergency Management Agency (2015c) *President Declares Disaster for South Carolina* [online] available from <http://www.fema.gov/news-release/2015/10/05/president-declares-disaster-south-carolina> [January 11th 2016]

Federal Emergency Management Agency (2014a) *About FEMA* [online] available from <http://www.fema.gov/about-fema> [August 13th 2014]

Federal Emergency Management Agency (2014b) *FEMA Region One* [online] available from <http://www.fema.gov/region-i-ct-me-ma-nh-ri-vt> [August 2014 2014]

Federal Emergency Management Agency (2014c) *Glossary* [online] available from <https://www.training.fema.gov/EMIWeb/emischool/EL361Toolkit/glossary.htm#D> [7th October 2014]

Federal Emergency Management Agency (2014d) *Disaster Declarations* [online] available from <https://www.fema.gov/disasters> [October 28th 2014]

Federal Emergency Management Agency (2014e) *Robert T. Stafford Disaster Relief and Emergency Assistance Act* [online] available from <http://www.fema.gov/media-library-data/1383153669955-21f970b19e8eaa67087b7da9f4af706e/stafford_act_booklet_042213_508e.pdf> [December 18th 2014]

Federal Emergency Management Agency (2014f) *Robert T. Stafford Disaster Relief and Emergency Assistance Act, as Amended, and Related Authorities as of April 2013* [online] available from <https://www.fema.gov/media-library/assets/documents/15271?fromSearch=fromsearch&id=3564> [December 18th 2014]

Federal Emergency Management Agency (2014g) *Regional Operations* [online] available from <https://www.fema.gov/regional-operations> [January 2015]

Federal Emergency Management Agency (2014h) *Hazard Mitigation Grants Programs: Frequently Ask Questions* [online] available from <https://www.fema.gov/hazard-mitigation-grant-programs-frequently-ask-questions#1> [January 2nd 2015]

Federal Emergency Management Agency (2014i) *Public Assistance: State Liaison* [online] available from <https://www.fema.gov/public-assistance-state-liaison> [January 3rd 2015]

Federal Emergency Management Agency (2014j) *Federal Guidance and Reporting - National Incident Management System (NIMS)* [online] available from <https://www.fema.gov/national-incident-management-system/implementation-guidance-and-reporting> [January 7th 2015]

Federal Emergency Management Agency (2014k) *About the Agency* [online] available from <https://www.fema.gov/about-agency> [January 7th 2015]

Federal Emergency Management Agency (2014l) *Community Emergency Response Team - CERT* [online] available from <https://www.fema.gov/community-emergency-response-teams> [January 7th 2015]

Federal Emergency Management Agency (2014m) *Whole Community* [online] available from <https://www.fema.gov/whole-community> [6th February 2015]

Federal Emergency Management Agency (2014n) *Regional Response Coordination Centers* [online] available from <http://www.fema.gov/media-library-data/1405096789424-a31c5fe7d43271fbc3f36efc4fb8aeb9/Fact+Sheet-RRCC-June+2014.pdf> [March 31st 2015]

Federal Emergency Management Agency (2013a) *Hurricane Sandy FEMA After Action Report* [online] available from <http://www.fema.gov/library/viewRecord.do?id=7906> [July 29th 2013]

Federal Emergency Management Agency (2013b) *The College List* [online] available from <https://www.training.fema.gov/EMIWeb/edu/collegelist/> [October 22nd 2014]

Federal Emergency Management Agency (2011) *A Whole Community Approach to Emergency Management: Principles, Themes, and Pathways for Action* [online] available from <http://www.fema.gov/media-library-data/20130726-1813-25045-0649/whole_community_dec2011__2_.pdf> [6th February 2015]

Federal Emergency Management Agency (2010a) *The Federal Emergency Management Agency - Publication 1 - November 2010* [online] available from <http://www.fema.gov/pdf/about/pub1.pdf> [December 17th 2014]

Federal Emergency Management Agency (2010b) *Incident Management Assistance Teams* [online] available from <http://www.fema.gov/pdf/media/factsheets/2010/imat_fact_sheet_10_05_10.pdf> [March 31st 2015]

Federal Emergency Management Agency (2008a) *The National Response Framework* [online] available from <http://www.fema.gov/pdf/emergency/nrf/nrf-core.pdf> [July 29th 2013]

Federal Emergency Management Agency (2008b) *The Incident Command System* [online] available from <http://training.fema.gov/emiweb/is/icsresource/assets/reviewmaterials.pdf> [March 30th 2015]

Federal Emergency Management Agency (2008c) *Emergency Management Assistance Compact - Overview for National Response Framework* [online] available from

<http://www.fema.gov/pdf/emergency/nrf/EMACoverviewForNRF.pdf> [January 3rd 2015]

Federal Emergency Management Agency (2008d) *Incident Command System Training Glossary* [online] available from <http://training.fema.gov/emiweb/is/icsresource/assets/icsglossary.pdf> [June 16th 2015]

Federal Emergency Management Agency (2008e) *Emergency Support Functions* [online] available from <http://www.fema.gov/media-library-data/20130726-1825-25045-0604/emergency_support_function_annexes_introduction_2008_.pdf> [March 1st 2016]

Federal Emergency Management Agency (2007) *Disaster Planning is Up to You* [online] available from <http://www.fema.gov/news-release/2007/03/30/disaster-planning-you> [November 5th 2015]

Federal Emergency Management Agency (2006) *Paulison and Johnson to Lead FEMA* [online] available from <https://www.fema.gov/news-release/2006/04/06/paulison-and-johnson-lead-fema> [January 7th 2015]

Federal Emergency Management Agency (2004) *NIMS and the Incident Command System* [online] available from <http://www.fema.gov/txt/nims/nims_ics_position_paper.txt> [July 20th 2015]

Federal Emergency Management Agency (1996) *A Guide for all-Hazards Emergency Operatons Planning* [online] available from <http://www.fema.gov/pdf/plan/slg101.pdf> [November 3rd 2014]

Federal Geographic Data Committee (N.D.) *DHS National Operations Center* [online] available from <https://www.geoplatform.gov/geoconops/hls-missions/disaster-operations/dhs-national-operations-center> [March 31st 2015]

Feldman, M. S., Bell, J., and Berger, M., T. (2003) *Gaining Access: A Practical and Theoretical Guide for Qualitative Researchers*. Oxford UK: Alta Mira Press

Finley, B. (2014) *Did FEMA Create a Youth Army?*. http://www.factcheck.org/2012/11/did-fema-create-a-youth-army/ edn. University of Pennsylvania: Annenberg Public Policy Center

Fire Safety Advice Centre (2011) *Carriage of Dangerous Goods* [online] available from <http://www.firesafe.org.uk/carriage-of-dangerous-goods-signs/> [June 4th 2015]

Fire Service College (2010) *Hydra Minerva* [online] available from <http://www.hydra-minerva.com/usergroup/fsc_details.htm> [July 1st 2015]

Fischer, F. (2003) *Reframing Public Policy: Discursive Politics and Deliberative Practices*. Oxford: Oxford University Press

Fischer, H. W., Gregoire, K., Scala, J., Letukas, L., Mellon, J., Romine, S., and Turner, D. (2006) *The Emergency Management Response to Hurricane Katrina: As Told by the First Responders - A Case Study of what Went Wrong and Recommendations for the Future* [online] available from <http://www.colorado.edu/hazards/research/qr/qr189/qr189.html> [April 11th 2015]

Fischer, H. W. (2003) 'The Sociology of Disaster: Definitions, Research Questions, & Measurements Continuation of the Discussion in a Post-September 11 Environment'. *International Journal of Mass Emergencies and Disasters* 21 (1), 91-107

Fleetwood, S. and Ackroyd, S. (eds.) (2004) *Critical Realist Applications in Organisation and Management Studies.* 1st edn. London: Routledge

Flin, R. H. and Arbuthnot, K. (2002) *Incident Command : Tales from the Hot Seat*. Aldershot, Hants,UK: Ashgate

Florida Division of Emergency Management (2015) *Current Situation* [online] available from <http://www.floridadisaster.org/index.asp> [January 2nd 2015]

Fontana, A. and Prokos, A. H. (2007) *Interview: From Formal to Postmodern* [online] . Walnut Creek, CA, USA: Left Coast Press. available from <http://site.ebrary.com/lib/coventry/docDetail.action?docID=10379867&ppg=1> [28th July 2014]

Ford, J. K. and Schmidt, A. M. (2000) 'Emergency Response Training: Strategies for Enhancing Realworld Performance'*. Journal of Hazardous Materials* 75 (2-3), 195-215

Form, W. H. and Nosow, S. (1958) *Community in Disaster*. New York, US: Harper and Brothers

Forrest, T. R. (1988) 'Reviewed Work: Sociology of Disasters: Contributions of Sociology to Disaster Research by Russell Dynes, Bruna Di Marchi, Carlo Pelanda'*. Contemporary Sociology* 17 (3), 317-319

Foster, J. (2012) *Writing Skills for Public Relations Style and Technique for Mainstream and Social Media*. 5th ed.. edn. London, UK: Kogan Page

Fradkin, P. L. (2005) *The Great Earthquake and Firestorms of 1906: How San Francisco nearly Destroyed itself*. London, UK: University of California Press

The FEMA Phoenix (1995) in *Washington Monthly*. 2006, Online

Freeman, L. C. (2004) *The Development of Social Network Analysis: A Study in the Sociology of Science*. Vancouver, Canada: Empirical Press

Friedrich, W. L. (2000) *Fire by the Sea: The Santorini Volcano: Natural History and the Legend of Atlantis*. 1st edn. Cambridge, UK: Cambridge University Press

Fu, T. C. (1996) 'Academic Libraries as High-Tech Gateways: A Guide to Design and Space Decisions'*. Journal of the American Society for Information Science* 47 (5), 401-402

Gall, M. D., Gall, J. P., and Borg, W. R. (2006) *Educational Research: An Introduction*. 8th edn. London: Pearson

Gallagher, P. (2015) *Hillsborough Inquest: Match Commander Admits "Far Reaching Deceit" After Lying about the Events* [online] available from <http://www.independent.co.uk/news/uk/home-news/hillsborough-inquest-match-commander-admits-far-reaching-deceit-after-lying-about-the-events-10107285.html> [April 8th 2015]

Galloway, G. E. (2005) 'Corps of Engineers Responses to the Changing National Approach to Floodplain Management since the 1993 Midwest Flood'*. Journal of Contemporary Water Research & Education* 130 (1), 5-12

Game, C. (ed.) (2010) *60th Political Science Association Annual Conference*. 'Ending this Way, Or Coming Back Around? Justin Timberlake on the Latest Reorganization of

English Local Government'. held March/April at Edinburgh, Scotland, UK. Online: Politcal Science Association

Garber, P. (2008) *50 Communications Activities, Ice Breakers, and Exercises* [online] available from <https://www2.cortland.edu/dotAsset/c1a635f6-a099-4ede-8f15-79b86e315088.pdf> [January 21st 2016]

Gardiner, J. (2002) 'What is Cobra?'. *Guardian Online* 21st October

Genesis (7) *Noah and the "Great Flood"* [online] available from <https://www.biblegateway.com/passage/?search=Genesis+7&version=NIV> [October 15th 2014]

Gerada, C. (2014) *Something is Profoundly Wrong with the NHS Today* [online] available from <http://php.nhs.uk/something-profoundly-wrong-nhs-today/> [December 18th 2014]

Gergen, K. J. (2001) *Social Construction in Context*. London: SAGE Publications

Gergen, K. J. (1995) *Constructivist Epistemology*.: Elizabeth Murphy

Gergen, K. J. (1985) 'The Social Constructionist Movement in Modern Psychology'. *American Psychologist* 40 (3), 266-275

Geue, K., Goetze, H., Buttstaedt, M., Kleinert, E., Richter, D., and Singer, S. (2010) 'An Overview of Art Therapy Interventions for Cancer Patients and the Results of Research'. *Complementary Therapies in Medicine* 18 (3-4), 160-170

Gibbs, G. R. (2007) *Thematic Coding and Categorizing: Analyzing Qualitative Data*. London UK: Sage Publications

Gilbert, C. (1998) 'Studying Disaster: Changes in the Main Conceptual Tools'. in *What is Disaster?: Perspectives on the Question*. ed. by Quarantelli, E. L. London UK: Routledge, 11-18

Gilbert, M. (2008) *The First World War: A Complete History*. London: Orion Books

Giles, L. (1910) *Sun Tzu on the Art of War*. London: The British Museum

Gill, P., Stewart, K., Treasure, E., and Chadwick, B. (2008) 'Methods of Data Collection in Qualitative Research: Interviews and Focus Groups'. *British Dental Journal* (204), 291-295

Gimmler, A., Lenk, C., and Aumuller, G. (eds.) (2002) *Health and Quality of Life.* Hamburg: Lit Verlag

Gioia, D. A., Schultz, M., and Corley, K. G. (2000) 'Organisational Identity, Image, and Adaptive Instability'. *Academy of Management Review* 25 (a), 63-81

Giroux, H. A. (2006) 'Reading Hurricane Katrina: Race, Class, and the Biopolitics of Disposability'. *College Literature* 33 (3), 171-196

Giuffrida, L. O. (1985) 'FEMA: Its Mission, its Partners'. *Public Administration Review* 45 (Jan), 2

Glen, W. (1996) 'Observations on the Mass-Extinction Debates'. *Special Paper 307: The Cretaceous-Tertiary Event and Other Catastrophes in Earth History* 307, 39-54

Glen, W. (1990) 'What Killed the Dinosaurs?'. *American Scientist (Online)* 78 (4), 354-370

Glucksberg, S. (2001) *Understanding Figurative Language from Metaphors to Idioms*. Oxford, UK: Oxford University Press

Gollom, M. (2014) *Why Emergency Services Need a "Culture Change" to Deal with PTSD* [online] available from <http://www.cbc.ca/news/canada/why-emergency-services-need-a-culture-change-to-deal-with-ptsd-1.2781733> [April 6th 2015]

Gomez, E., Plotnick, L., Rohn, E., Morgan, J., and Turoff, M. (eds.) (2007) *Hawaii International Conference on Systems Sciences (HICSS)*. 'Towards a Unified Public Safety Scale'. held 3rd-6th January at Waikoloa, Hawaii. Waikoloa, Hawaii: HICSS

Gonzalez, J. J., Granmo, O., Munkvold, B. E., Li, F. Y., and Dugdale, J. (eds.) (2012) *9th International Conference on Information Systems for Crisis Response and Management - ISCRAM*. 'Multidisciplinary Challenges in an Integrated Emergency Management Approach'. held April 2012 at Vancouver, Canada. http://www.iscramlive.org/ISCRAM2012/proceedings/307.pdf: ISCRAM

Gordon, W. and Robson, S. (eds.) (1982) *Market Research Society Conference*. 'Respondent through the Looking Glass: Towards a Better Understanding of the Qualitative Interviewing Process'. held N.D. at London. London UK: MRS

Gorski, P. S. (2013) 'What is Critical Realism? and Why should I Care?'. *Contemporary Sociology* 42 (5), 648-670

Gow, K. and Paton, D. (eds.) (2008) *The Phoenix of Natural Disasters: Community Resilience.* New York, US: Nova Science Publishers

Grady, J. (1997) *Foundations of Meaning: Primary Metaphors and Primary Scenes*. Unpublished Doctoral thesis or dissertation. U.S.A.: University of California, Berkeley

Grant, D. and Oswick, C. (1996) *Metaphor and Organizations*. 1st edn. London: Sage

Gray, C. K. (2013) *The Tribal Moment in American Politics the Struggle for Native American Sovereignty*. Lanham: AltaMira Press

Gray, D. E. (2009) 'Theoretical Perspectives and Research Methodologies'. in *Doing Research in the Real World*. ed. by AnonLondon: SAGE Publications, 16-38

Greece, G., Shaw, D., and Hayashi, H. (2015) 'Application of the Viable System Model to Analyse Communications Structures: A Case Study of Disaster Response in Japan'. *European Journal of Operational Research* 243 (1), 312-322

Greece, G., Shaw, D., and Hayashi, H. (2013) 'Using the Viable System Model (VSM) to Structure Information Processing Complexity in Disaster Response'. *European Journal of Operational Research* 224 (1), 209-218

Greenaway, K. (1881) *Mother Goose*. Illustrated Edition edn. London: George Routledge & Sons

Gregor, S. (2005) 'Interpretivism and Constructivism: The Struggle Towards an Understanding of Theory in Information Systems'. in *Information Systems Foundations: Constructing and Criticising*. ed. by Hart, D. and Gregor, S. Canberra, ACT: ANU E Press, 3-13

Groenendaal, J. and Helsloot, I. (2015) 'A Preliminary Examination of Command and Control by Incident Commanders of Dutch Fire Services during Real Incidents'. *Journal of Contingencies and Crisis Management* In Pres

Groenendaal, J., Helsloot, I., and Scholtens, A. (2013) 'A Critical Examination of the Assumptions regarding Centralized Coordination in Large-Scale Emergency Situations'. *Journal of Homeland Security and Emergency Management* 10 (1)

Guardian Online (2012) *Superstorm Sandy - Your Questions Answered* [online] available from <http://www.theguardian.com/world/shortcuts/2012/oct/30/hurricane-sandy-your-questions-answered> [October 8th 2014]

Guba, E. G. and Lincoln, Y. S. (1994) 'Competing Paradigms in Qualitative Research'. in *Handbook of Qualitative Research*. ed. by Denzin, N. K. and Lincoln, Y. S. Thousand Oaks, California, USA: Sage Publications, 105-117

Gubrium, J. and Lolstein, J. (eds.) (2001) *Handbook of Interview Research.* 1st edn. London: Sage Publications

Gummesson, E. (2000) *Qualitative Methods in Management Research*. 2nd edn. London: Sage Publications

Gunelius, S. (2015) *Rebranding Essentials - Part 1: Why Rebrand?* [online] available from <https://aytm.com/blog/research-junction/rebranding-essentials-why-rebrand/> [October 21st 2015]

Gyongyi, K. and Spens, K. (2009) 'Identifying Challenges in Humanitarian Logistics'. *International Journal of Physical Distribution and Logistics Management* 39 (6), 506-528

H.M. Government (2016) *Consultation Enabling Closer Working between the Emergency Services* [online] available from <https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/459986/Consultation_-_Enabling_closer_working_between_the_Emergency_Services__w__2_.pdf> [October 25th 2015]

H.M. Government (2015) *Enabling Closer Working between the Emergency Services* [online] available from <https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/495371/6.1722_HO_Enabling_Closer_Working_Between_the_Emergency_Services_Consult....pdf> [February 14th 2016]

H.M. Government (2014a) *Glossary: Joint Emergency Services Interoperability Programme* [online] available from <http://www.jesip.org.uk/glossary/> [February 2014 2014]

H.M. Government (2014b) *Local Resilience Forum: Contact Details* [online] available from <https://www.gov.uk/local-resilience-forums-contact-details> [November 4th 2014]

H.M. Government (2014c) *Human Rights Act (1998)* [online] available from <http://www.legislation.gov.uk/ukpga/1998/42/contents> [November 24th 2014]

H.M. Government (2014d) *Understand how Your Council Works* [online] available from <https://www.gov.uk/understand-how-your-council-works/types-of-council> [14th July 2015]

H.M. Government (2013a) *Responding to Emergencies: The UK Central Government Response Concept of Operations (CONOPS)* [online] available from

<https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/192425/CONOPs_incl_revised_chapter_24_Apr-13.pdf> [29th June 2013]

H.M. Government (2013b) *Emergency Response and Recovery: Improving the U.K.s Ability to Absorb, Respond to and Recover from Emergencies* [online] available from <https://www.gov.uk/government/publications/emergency-response-and-recovery> [February 20th 2014]

H.M. Government (2013c) *Joint Emergency Services Interoperability Programme - JESIP* [online] available from <http://www.jesip.org.uk/> [November 3rd 2013]

H.M. Government (2013d) *Preparation and Planning for Emergencies: Responsibilities of Responder Agencies and Others* [online] available from <https://www.gov.uk/preparation-and-planning-for-emergencies-responsibilities-of-responder-agencies-and-others> [November 3rd 2014]

H.M. Government (2013e) *The National Recovery Guidance* [online] available from <https://www.gov.uk/national-recovery-guidance> [February 20th 2014]

H.M. Government (2013f) *Emergency Responder Interoperability: Lexicon*. 2.1.1 edn. London: Cabinet Office

H.M. Government (2013g) *Improving the UK's Ability to Absorb, Respond to and Recover from Emergencies* [online] available from <https://www.gov.uk/government/policies/improving-the-uks-ability-to-absorb-respond-to-and-recover-from-emergencies> [August 13th 2014]

H.M. Government (2013h) *The Joint Doctrine: The Interoperability Framework* [online] available from <http://www.jesip.org.uk/wp-content/uploads/2013/07/JESIP-Joint-Doctrine.pdf> [April 8th 2015]

H.M. Government (2012a) *Emergency Preparedness: Guidance on Part One of the Civil Contingencies Act 2004, its Associated Regulations and Non-Statutory Arrangements* [online] available from <https://www.gov.uk/government/publications/emergency-preparedness> [February 20th 2014]

H.M. Government (2012b) *Enhanced SAGE Guidance: A Strategic Framework for the Scientific Advisory Group for Emergencies* [online] available from <https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/80087/sage-guidance.pdf> [31st March 2015 2015]

H.M. Government (2012c) *Civil Protection Common Map Symbology* [online] available from <https://www.gov.uk/government/publications/emergency-responder-interoperability-common-map-symbols> [June 4th 2015]

H.M. Government (2011a) *Strategic National Framework on Community Resilience* [online] available from <https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/60922/Strategic-National-Framework-on-Community-Resilience_0.pdf> [November 3rd 2014]

H.M. Government (2011b) *Chapter 5 (Emergency Planning) Revision to Emergency Preparedness* [online] available from <https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/61028/Emergency_Preparedness_chapter5_amends_21112011.pdf> [June 4th 2015]

H.M. Government (2010) *A Strong Britain in an Age of Uncertainty: The National Security Strategy* [online] available from

<https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/61936/national-security-strategy.pdf> [November 4th 2014]

H.M. Government (2004a) *Civil Contingencies Act 2004: A Short Guide (Revised)*.: The Cabinet Office

H.M. Government (2004b) *The Civil Contingencies Act* [online] available from <http://www.legislation.gov.uk/ukpga/2004/36/pdfs/ukpga_20040036_en.pdf> [September 18th 2011]

H.M. Government (2004c) *Civil Contingencies Act (2004) - Part One: Local Arrangements for Civil Protection* [online] available from <http://www.legislation.gov.uk/ukpga/2004/36/part/1> [October 29th 2014]

H.M. Government (2004d) *Civil Contingencies Act (2004) - Part Two: Emergency Powers* [online] available from <http://www.legislation.gov.uk/ukpga/2004/36/part/2> [October 29th 2014]

H.M. Government (2004e) *Civil Contingencies Act (2004) - Part Three: General* [online] available from <http://www.legislation.gov.uk/ukpga/2004/36/part/1> [October 29th 2014]

H.M. Government (1989) *The Official Secrets Act* [online] available from <https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/264795/officalsecretsact.pdf> [August 26th 2015]

H.M. Government (1986) *Civil Defence in Peactime Act (1986) - Repealed* [online] available from <http://www.legislation.gov.uk/ukpga/1986/22/contents> [28th October 2014 2014]

H.M. Government (1964) *The Emergency Powers Act (1920) - Amended 1964* [online] available from <http://www.legislation.gov.uk/ukpga/1964/38> [October 28th 2014]

H.M. Government (1948) *The Civil Defence Act* [online] available from <http://www.legislation.gov.uk/ukpga/Geo6/12-13-14/5/contents> [September 25th 2011]

H.M. Government (1920) *The Emergency Powers Act (1920) - Repealed* [online] available from <http://www.legislation.gov.uk/ukpga/Geo5/10-11/55/contents> [October 28th 2014]

Hacking, I. (1981) *Scientific Revolutions*. Oxford: Oxford University Press

Haddow, G., Bullock, J. A., and Coppola, D. P. (2011) *Introduction to Emergency Management*. 4th edn. Burlington, Massachusetts US: Elsevier Science

Haddow, G., Bullock, J. A., and Coppola, D. P. (2007) *Introduction to Emergency Management*. 3rd edn. Burlington, Massachusetts US: Elsevier Science

Halcomb, E. J. and Davidson, P. M. (2006) 'Is Verbatim Transcription of Interview Data always Necessary?'. *Applied Nursing Research* 19, 38-42

Halvorson, A. (2010) *Understanding the Military: The Institution, the Culture, and the People*. Online: Substance Abuse and Mental Health Services Administration

Hamilton, H. and Clare, J. (2004) 'Reviewing the Literature: Making 'the Literature' Work for You'. *Collegian* 11 (1), 8-11

Hammersley, M. and Atkinson, P. (2007) *Ethnography : Principles in Practice*. 3rd edn. London and New York: Routledge

Handmer, J. W. and Parker, D. J. (1992) *Hazard Management and Emergency Planning : Perspectives on Britain*. London: London : James & James

Haney, E. L. (2002) *Inside Delta Force - the Real Story of America's Elite Military Unit*. London, UK: Transworld Publishers

Hanson, W. E., Cresswell John W., Plano Clark, V. L., Petska, K. S., and J. David Cresswell (2005) 'Mixed Methods Research in Counselling Psychology'. *Journal of Counselling Psychology* 52 (2), 224-235

Harries, K. (1978) 'Afterthoughts on Metaphor'. *Critical Inquiry* 5 (1), 167-174

Hartman, C. and Squires, G. D. (eds.) (2006) *There is no such Thing as a Natural Disaster: Race, Class, and Hurricane Katrina.* New York, US: Routledge

Hasbro (2015) *Trivial Pursuit* [online] available from <http://www.hasbro.com/en-us/search?q=trivial+pursuit+> [November 27th 2015]

Hashim, K. F., Ishak, S. H., and Ahmad, M. (2015) 'A Study on Social Media Application as a Tool to Share Information during Flood Disaster'. *ARPN Journal of Engineering and Applied Sciences* 10 (3), 959-967

Haught, C. (2013) 'Spain is Not Greece: How Metaphors are Understood'. *Journal of Psycholinguistic Research*, 1-6

Hausmann-Muela, S. and Eckl, J. (2015) 'Re-Imagining Malaria - A Platform for Reflections to Widen Horizons in Malaria Control'. *Malaria Journal* 14 (1), online

Hawe, G. I., Wilson, D. T., Coates, G., and Crouch, G. (eds.) (2012) *9th International Conference on Information Systems for Crisis Response and Management -ISCRAM*. 'STORMI: An Agent-Based Simulation Environment for Evaluating Responses to Major Incidents in the UK'. held April at Vancouver, Canada. Online: ISCRAM

Haynes, H. J. G. and Stein, G. P. (2014) *U.S. Fire Department Profile 2013 - National Fire Protection Association (NFPA) Fire Analysis and Research Division* [online] available from <file:///C:/Users/ab3426/Downloads/osfdprofile.pdf> [July 21st 2015]

Heijes, C. (2007) 'Officers at Work in a Multicultural Police Force'. *Policing* 30 (4), 550-566

Helsloot, I. (2008a) 'Coordination is a Prerequisite for Good Collaboration, Isn't it?'. *Journal of Contingencies & Crisis Management* 16 (4), 173-176

Helsloot, I. (ed.) (2008b) *European Group for Organizational Studies Conference*. 'Symbolism at the Core of Public Governance of Safety'. held July at Amsterdam, Netherlands. Online: EGOS

Hendrickson, A. (2006) *Emergency Preparedness & Response (Aka FEMA) & the National Response Plan* [online] available from <http://www.epa.gov/osp/tribes/NatForum06/5_11.pdf> [March 31st 2015]

Henn, M., Weinstein, M., and Foard, N. (2006) *A Short Introduction to Social Research*. 1st edn. London UK: SAGE Publications

Herrera-Restrepo, O., Truants, K., Trainor, J., Murray-Tuite, P., and Edara, P. (In Pres) 'A Multi-Perspective Dynamic Network Performance Efficiency Measurement of an Evacuation: A Dynamic Network-DEA Approach'. *Omega, the International Journal of Management Science*, 1-15

Herzhog, H. (2005) 'On Home Turf: Interview Location and its Social Meaning'. *Qualitative Sociology* 28 (1), 25-47

Hesse-Biber, S. N. (2010) *Mixed Methods Research: Merging Theory with Practice*. London: The Guildford Press

Hildebrand, A. R., Penfield, G. T., Kring, D. A., Pilkington, M., Camargo, Z. A., Jacobsen, S., and Boynton, W. V. (1991) 'Chicxulub Crater: A Possible Cretaceous-Tertiary Boundary Impact Crater on the Yucatán Peninsula, Mexico'. *Geology* 19, 867-871

Hills, A. E. (1994) 'Co-Ordination and Disaster Response in the United Kingdom'. *Disaster Prevention and Management* 3 (1), 66-71

Hirschheim, R. (N.D.) *Philosophy of Science and Research Methods in IS* [online] available from <http://www.darsis.dk/fileadmin/user_upload/Darsis_course_Oct_2010/Philosophy_of_Science_and_Research_Methods_ISDS7950_v2.pdf> [6th June 2014]

Hoffman, B. (1998) *Inside Terrorism*. New York, US: Columbia University Press

Hofstede, G. (1998) 'Identifying Organizational Subcultures: An Empirical Approach'. *Journal of Management Studies* 35 (1), 1-12

Hofstede, G., Neuijen, B., Ohayv, D. D., and Sanders , G. (1990) 'Measuring Organizational Cultures: A Qualitative and Quantitative Study Across Twenty Cases'. *Administrative Science Quarterly* 35 (2), 286-316

Hogg, S. J. (1980) 'Reconstruction Following Seismic Disaster in Venzone, Fruili'. *Disasters* 4 (2), 173-185

Holguin-Veras, J., Perez, N., Ukkusuri, S., Wachtendorf, T., and Brown, B. (2007) 'Emergency Logistics Issues Affecting the Response to Katrina: A Synthesis and Preliminary Suggestions for Improvements'. *Transportation Research Record: Journal of the Transportation Research Board* (2022), 76-82

Holloway, I. and Wheeler, S. (2002) *Qualitative Research in Nursing*. 2nd edn. Oxford: Blackwell Publishing

Homer (1998) *The Iliad*. trans. by Fagles, R. Harmondsworth: Penguin Books

Houchens, G. W., Hurt, J., Stobaugh, R., and Keedy, J. L. (2012) 'Double- Loop Learning: A Coaching Protocol for Enhancing Principal Instructional Leadership'. *Qualitative Research in Education* 1 (2), 135-178

Houghton, R. J., Baber, C., McMaster, R., Stanton, N. A., Salmon, P., Stewart, R., and Walker, G. (2006) 'Command and Control in Emergency Services Operations: A Social Network Analysis'. *Ergonomics* 49 (12-13), 1204-1225

House of Lords (2009) *Civil Protection and Crisis Management in the European Union - 6th Report of Session 2008-2009 - HL Paper 43*. London UK: European Union Committee

House, A., Power, N., and Alison, L. (2014) 'A Systematic Review of the Potential Hurdles of Interoperability to the Emergency Services in Major Incidents: Recommendations for Solutions and Alternatives'. *Cognition, Technology and Work* 16 (3), 319-335

House, R., Javidan, M., Hanges, P., and Dorfman, P. (2002) 'Understanding Cultures and Implicit Leadership Theories Across the Globe: And Introduction to Project GLOBE'. *Journal of World Business* 37 (1), 3-10

Houses of Parliament (N.D.) *Education Services: How Laws are made - UK* [online] available from <http://www.parliament.uk/education/about-your-parliament/how-laws-are-made/> [November 24th 2014]

Humber Emergency Planning Service (N.D.) *Humber Local Resilience Forum Core Groups* [online] available from <http://www.heps.gov.uk/easysiteweb/getresource.axd?assetid=203934&type=0&servicetype=1> [November 6th 2014]

Iarossi, G. (2006) *Power of Survey Design: A User's Guide for Managing Surveys, Interpreting Results and Influencing Respondents*. Herndon VA USA: World Bank Publications

Ickes, W., Park, A., and Johnson, A. (2012) 'Linking Identity Status to Strength of Sense of Self: Theory and Validation'. *Self & Identity* 11 (4), 531-544

Indiana Department of Homeland Security (N.D.) *Incident Management Assistance Team - IMAT* [online] available from <http://www.in.gov/dhs/2404.htm> [January 2015]

Inje University (ed.) (2009) *Use of Incident Management Systems in Fire Management*. 'International Symposium'. held 3rd February: Korea Forest Research Institute, Inje University

International Atomic Energy Agency (2014) *INES - the International Nuclear and Radiological Event Scale* [online] available from <http://www-ns.iaea.org/tech-areas/emergency/ines.asp> [October 8th 2014]

International Centre for Critical Realism (2014a) *What is Critical Realism?* [online] available from <http://international-criticalrealism.com/about-critical-realism/> [6th June 2014 2014]

International Centre for Critical Realism (2014b) *Basic Critical Realism* [online] available from <http://international-criticalrealism.com/about-critical-realism/basic-critical-realism/> [6th June 2014]

International Federation of the Red Cross and Red Crescent Societies (2014) *World Disaster Report 2004: Focus on Community Resilience* [online] available from <http://www.ifrc.org/publications-and-reports/world-disasters-report/wdr2004/> [October 6th 2014]

International Federation of the Red Cross and Red Crescent Societies (2012) *What is Disaster?* [online] available from <http://www.ifrc.org/en/what-we-do/disaster-management/about-disasters/what-is-a-disaster/> [September 23rd 2014]

International Olympic Committee (2013) *Factsheet: Opening Ceremonies of the Winter Olympics Games* [online] available from <http://www.olympic.org/documents/reference_documents_factsheets/opening_ceremony_of_the_olympic_winter_games.pdf> [October 15th 2014]

Ionescu, C. M. (2013) *The Human Respiratory System: An Analysis of the Interplay between Anatomy, Structure, Breathing and Fractal Dynamics*. Dordrecht, Belgium: Springer

Ivancerich, J. M., Donnelly, J. H., and Gibson, J. L. (1991) *Management: Principles and Functions,* . 4th edn. Homewood, Illinois, US: Richard D.Irwin Inc.,

Jansen, B. J., Spink, A., and Taksa, I. (2008) *Handbook of Research on Web Log Analysis*. Bingley, United Kingdom: Emerald Group Publishing Limited

Jensen, J. and Carr, J. (2015) 'Predisaster Integration of Community Emergency Response Teams'. *Journal of Emergency Management* 13 (1), 25-35

Jensen, J. and Thompson, S. (2015) 'The Incident Command System: A Literature Review'. *Disasters* In Pres (Aug)

Jensen, J. and Youngs, G. (2015) 'Explaining Implementation Behaviour of the National Incident Management System (NIMS)'. *Disasters* 39 (2), 362-388

Jensen, J., Bundy, S., Thomas, S., and Yakubu, M. (2014) 'The County Emergency Manager's Role in Disaster Recovery'. *International Journal of Mass Emergencies and Disasters* 32 (1), 157-193

Jensen, J. and Waugh, W. L. (2014) 'The United States' Experience with the Incident Command System: What we Think we Know and what we Need to Know More about'. *Journal of Contingencies & Crisis Management* 22 (1), 5-17

Jensen, J. (2011) 'The Current NIMS Implementation Behaviour of United States Counties'. *Journal of Homeland Security and Emergency Management* 8 (1), 1-20-Article 20

Jensen, J. and Yoon, D. K. (2011) 'Volunteer Fire Department Perceptions of ICS and NIMS'. *Journal of Homeland Security and Emergency Management* 8 (1), 1-19-Article 14

Jensen, J. (2010a) *The Argument for a Disciplinary Approach to Emergency Management Higher Education*. Article edn. Online: Emergency Management Institute

Jensen, J. (2010b) *Emergency Management Policy: Predicting National Incident Management System (NIMS) Implementation Behaviour*. [online] PhD thesis or dissertation. Fargo, North Dakota, US: North Dakota State University

Jensen, J. (2009) 'NIMS in Rural America'. *International Journal of Mass Emergencies and Disasters* 27 (3), 218-249

Jewell, R. (2013) *Critical Or Interpretative Analysis of Literature - University of Minnesota* [online] available from <http://www.tc.umn.edu/~jewel001/CollegeWriting/WRITELIT/LitAnalysis/default.htm> [September 3rd 2014]

Jigyasu, R. (2005) 'Disaster: A "Reality" Or Construct"?'. in *What is a Disaster?: New Answers to Old Questions*. ed. by Perry, R. W. and Quarantelli, E. L. Philadelphia US: Xlibris, 49-59

Johnson, G. P., Holmes Jr, R. R., and Waite, L. A. (2003) *The Great Flood of 1993 on the Upper Mississippi River - 10 Years Later - United States Geological Survey* [online] available from <https://www.leopold.iastate.edu/sites/default/files/events/USGS.pdf> [December 22nd 2014]

Johnson, J., Scholes, K., and Whittington, R. (2008) *Exploring Corporate Strategy Text & Cases*. 8th Edition edn. Harlow, UK: Prentice Hall

Joint Emergency Services Interoperability Programme (2015a) *Joint Organisational Learning* [online] available from <http://www.jesip.org.uk/joint-organisational-learning> [October 30th 2015]

Joint Emergency Services Interoperability Programme (2015b) *JESIP News - Issue 12 September* [online] available from <http://www.jesip.org.uk/uploads/media/Newsletters/Edition%2012/JesipNewsletter_A4_HR.pdf> [October 16th 2015]

Joint Emergency Services Interoperability Programme (2015c) *Joint Decision Model* [online] available from <jesip joint decision model> [November 5th 2015]

Joint Emergency Services Interoperability Programme (2014) *JESIP News - Issue 7 August* [online] available from <http://aace.org.uk/wp-content/uploads/2014/08/JESIP-News-August-2014-HR.pdf> [October 2015 2015]

Jones, C. (1985) *Patterns of Social Policy: An Introduction to Comparative Analysis*. :London UK: Routledge

Joseph, F. (2004) *The Destruction of Atlantis: Compelling Evidence of the Sudden Fall of the Legendary Civilization*. Rochester, VA US: Bear & Company

Jun, J. S. (2006) *The Social Construction of Public Administration: Interpretative and Critical Perspectives*. Ithaca, New York: State University of New York Press

Jupp, V. (2006) *SAGE Dictionary of Social Research Methods [Online]*. Available from: http://www.myilibrary.com?ID=124045: SAGE Publications Ltd

Kapucu, N. (2015) *Emergency Management: Whole Community Approach - Encyclopedia of Public Administration and Policy 3rd Edition* [online] available from <http://www.academia.edu/10360931/Emergency_Management_Whole_Community_Approach> [6th February 2015]

Kapucu, N. (2010) *Emergency and Crisis Management in the United Kingdom: Disasters Experienced, Lessons Learned, and Recommendations for the Future* [online] available from <https://www.training.fema.gov/hiedu/downloads/compemmgmtbookproject/comparative%20em%20book%20-%20chapter%20-%20emergency%20and%20crisis%20mgmt%20in%20the%20uk-disasters,%20lessons%20and%20recomm.doc> [August 21st 2013]

Kapucu, N., Yuldahsev, F., and Arslan, T. (2010) 'Social Network Analysis (SNA) Applications in Evaluating MPA Classes'. *Journal of Public Affairs Education* 16 (4), 541-563

Kapucu, N. (2009a) 'Performance Under Stress: Managing Emergencies and Disasters'. *Public Performance and Management Review* 32 (3), 339-344

Kapucu, N. (2009b) 'Interstate Partnerships in Emergency Management: Emergency Management Assistance Compact (EMAC) in Response to Catastrophic Disasters'. *Public Administration Review* 69 (2), 297-313

Kapucu, N. (2008) 'Collaborative Emergency Management: Better Community Organising, Better Preparedness and Response'. *Disasters* 32 (8), 239-262

Kapucu, N. and Van Wart, M. (2008) 'Making Matters Worse: An Anatomy of Leadership Failures in Managing Catastrophic Events'. *Administration & Society* 40 (7), 711-740-740

Kapucu, N. (2006) 'Examining the National Response Plan in Response to a Catastrophic Disaster: Hurricane Katrina in 2005'. *International Journal of Mass Emergencies and Disasters* 24 (2), 271-299

Kapucu, N. and Van Wart, M. (2006) 'The Evolving Role of the Public Sector in Managing Catastrophic Disasters: Lessons Learned'. *Administration and Society* 38 (3), 279-308

Keim, B. D. (2009) *Hurricanes of the Gulf of Mexico*. Baton Rouge, Louisiana, US: Louisiana State University Press

Kelman, I. (2011) *The Bradford Disaster Research Unit* [online] available from <http://www.ilankelman.org/bdru.html> [October 22nd 2014]

Kennebec County Emergency Management Agency (N.D.) *Kennebec County EMA Department Narrative* [online] available from <http://www.kq1l.com/kcema/kcema.html> [January 7th 2015]

Knox County Maine Emergency Management Agency (2015) *Emergency Management Agency* [online] available from <http://www.knoxcountymaine.gov/ema> [January 7th 2015]

Knox, J. S. (1922) *Salesmanship and Business Efficiency*.: University of British Columbia

Kolakowski, L. (2004) *Social Research: Philosophy, Politics and Practice*. London UK: Sage

Konrad, J. and Shroder, T. (2011) *Fire on the Horizon: The Untold Story of the Gulf Oil Disaster*. New York, US: HarperCollins

Kotler, P. and Casoline, J. A. (2009) *The New Normality: A Paradigm Shift* [online] available from <http://www.chaoticsstrategies.com/2009/03/the-new-normality-a-paradigm-shift/> [29th October 2014 2014]

Krause, D. (1995) *The Art of War for Executives*. 1st edn. New York: Perigee Trade

Kreps, G. A. (1998) 'Disaster as Systematic Event and Social Catalyst'. in *What is a Disaster?; Perspectives on the Question*. ed. by Quarantelli, E. L. London UK: Routledge, 31-55

Kreps, G. A. (ed.) (1989) *Social Structure and Disaster.* Newark, De, US: University of Delaware Press

Kreps, G. A. (1984) 'Sociological Inquiry and Disaster Research'. *Annual Review of Sociology* 10, 309-330

Kring, D. A. (2000) 'Impact Events and their Effect on the Origin. Evolution and Distribution of Life'. *GSA Today* 10 (8), 1-1

Kuhn, T. S. (1996) *The Structure of Scientific Revolution*. 3rd edn. Chicago IL: University of Chicago Press

Kurokawa, K. (2012) *The National Diet of Japan: The Official Report of the Fukushima Nuclear Accident Independent Investigation Commission*. [online]: Fukushima Nuclear Accident Independent Investigation Commission

Lagadec, E. (2007) *Unconventional Crises, Unconventional Responses: Reforming Leadership in the Age of Catastrophic Crises and Hypercomplexity*. John Hopkins University: Center for Trans-Atlantic Relations

Lagadec, P. (2006) *A New Cosmology of Risk and Crises: Time for a Radical Shift in Paradigm and Practice* [online] available from <http://www.patricklagadec.net/fr/pdf/New_Cosmology.pdf> [25th October 2015 2015]

Lakoff, G. and Johnson, M. (2003) *Metaphors we Live by*. Digital edn. London, U.K.: University of Chicago Press

Lakoff, G. and Johnson, M. (1999) *Philosophy in the Flesh: The Embodied Mind and its Challenge to Western Thought*. New edn. New York: Basic Books

Lakoff, G., Espenson, J., and Schwartz, A. (1991) *Master Metaphor List* [online] available from <http://araw.mede.uic.edu/~alansz/metaphor/METAPHORLIST.pdf> [July, 10th 2012]

Lambert III, M. J. (2009) 'A Review of "Images of Organizations" 2006'. *Complicity: An International Journal of Complexity and Education* 6 (2), 156-158

Lancashire County Council (2014) *Civil Contingencies Act 2004* [online] available from <http://www3.lancashire.gov.uk/corporate/web/view.asp?siteid=5615&pageid=38322&e=e> [November 24th 2014]

Lang, T. (ed.) (2008) *Academy of Management 2008 Annual Meeting: The Questions we Ask, AOM 2008* . 'Systemizing the Organizational Scenario Literature using Morgan's Metaphors'. held 8th-13th August 2008 at Anaheim, CA, USA. USA: Academy of Management

Larsen, J. A. (2013) *Responding to Catastrophic Events: Consequence Management and Policies*. New York US: Palgrave MacMillan

Laska, P. R. (2011) *Interface: A Guide for Professionals Supporting the Criminal Justice System*. London, UK: Springer

Laska, S. and Morrow, B. H. (2006) 'Social Vulnerabilities and Hurricane Katrina: An Unnatural Disaster in New Orleans'. *Marine Technology Society Journal* 40 (4), 16-26

Latin Language Phrases (2009) *I Will either Find a Way Or make One* [online] available from <http://latinlanguagephrases.com/i-will-either-find-way-or-make-one> [August 20th 2014]

Latour, B. and Woolgar, S. (1988) *The Politics of Explanation: An Alternative*. London: Sage

Lauta, K. C. (2015) *Disaster Law*. 1st edn. Abingdon, Oxon, UK: Routledge

Lavelle, P. (2008) *On the Trail of the Black Death*.: ABC New in Science

Lavrakas, P. J. (2004) 'Questionnaires'. in *The SAGE Encyclopaedia of Social Science Research Methods*. ed. by Lewis-Beck, M. S., Bryman, A., and Liao, T. F. Thousand Oaks CAhttp://www.refworks.com/refworks2/?r=references%7CMainLayout::init#: SAGE Publishing, 1102

Lawely, J. (2012) *Metaphors of Organisation - Part 1* [online] available from <http://www.cleanlanguage.co.uk/articles/articles/19/1/Metaphors-of-Organisation-part-1/Page1.html> [August 16th 2012]

Lawley, J. (2001) 'Metaphors of Organisations'. *Effective Consulting* 1 (4)

Leaning, J. (2013) *Natural Disasters, Armed Conflict and Public Health*. http://www.nejm.org/doi/full/10.1056/NEJMra1109877?query=featured_home& edn. New England, US: New England Journal of Public Health

Leeds-Hurwitz, W. (2009) 'Social Construction of Reality'. in *Encyclopaedia of Communication Theory*. ed. by Littlejohn, S. W. and Foss, K. A. Thousand Oaks Calif: SAGE Publications, 892-895

Leicester, Leicestershire and Rutland Local Resilience Forum (2010) *Local Resilience Forum Major Incident Plan* [online] available from <http://localresilienceforum.org.uk/files/uploads/LRF_MAJOR_INCIDENT_PLAN_LESS_NUMBERS_FOR_PUBLIC_WEBSITE_.V10_-_approved_at_Exec_LRF_24_June_2010.pdf> [November 6th 2014]

Lendering, J. (2005) *Phalanx and Hoplites*. Amsterdam: Livius.org

Leonard, H. B. and Howitt, A. M. (2010) 'Organising Response to Extreme Emergencies: The Victorian Bushfires of 2009'. *Australian Journal of Public Administration* 69 (4), 372-386

Lewis, J., Phillip, O., and Westgate, K. N. (1976) *A Philosophy of Planning - Occasional Paper no: 5 - Bradford Disaster Research Unit* [online] available from <http://www.ilankelman.org/miscellany/BDRU05.pdf> [February 3rd 2015]

Lincoln County Emergency Management Agency (2009) *What is Emergency Management Cycle?*. Online: Lincoln County Emergency Management Agency

Lincoln, K. and Thomassen, L. (2009) *How to Succeed at Retail: Wining Case Studies and Strategies for Retailers*. Philadelphia, US: Kogan Page

Lindell, M. K. (2011) *Disaster Studies - International Sociological Association* [online] available from <http://www.sagepub.net/isa/resources/pdf/disaster%20studies.pdf> [October 20th 2014]

Lindsay, B. R. and Murray, J. (2009) *Disaster Relief Funding and Emergency Supplemental Appropriations 7-57000 - R40708*. Washington D.C. US: Congressional Research Service

Liu, J. H., Paez, D., Slawuta, P., Cabecinhas, R., Techio, E., Kokdemir, D., Sen, R., Vincze, O., Muluk, H., Wang, F., and Zlobina, A. (2009) 'Representing World History in the 21st Century: The Impact of 9/11, the Iraq War, and the Nation-State on Dynamics of Collective Remembering'. *Journal of Cross-Cultural Psychology* 40 (4), 667-692

Livesey, C. (2012) *Theory & Methods a Resource-Based Learning Approach* [online] available from <http://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&sqi=2&ved=0CCsQFjAA&url=http%3A%2F%2Fwww.sociology.org.uk%2Ftmmeth1.doc&ei=0HyQU5YFjLDtBtObgYgK&usg=AFQjCNGAWfEEHcxRn6S3roouD-FWjXgrFg&bvm=bv.68235269,d.ZGU> [6th June 2014]

Local Resilience Forum Gloucestershire (2013) *Strategic Framework 2013-16* [online] available from <http://glosprepared.co.uk/wp-content/uploads/2013/10/LRF-Strategic-Framework-2013-16.pdf?b1d2c3> [November 6th 2014]

Locke, E. A. and Latham, G. P. (2002) 'Building a Practically Useful Theory of Goal Setting and Task Motivation: A 35-Year Odyssey'. *American Psychologist* [online] 57 (9), 705-717. available from <http://psycnet.apa.org/journals/amp/57/9/705/> [30th April 2014]

Locke, E. A. (1968) 'Towards a Theory of Task Motivation and Incentives'. *Organizational Behavior and Human Performance* 3 (2), 157-189

Loimer, H. and Guanieri, M. (1996) 'Public Health then and Now - Accidents and Acts of God: A History of the Terms'. *America Journal of Public Health* 86 (1), 101-107

London Emergency Services Liaison Panel (2012) *Major Incident Procedure Manual - Eighth Edition* [online] available from <http://www.leslp.gov.uk/docs/major_incident_procedure_manual_8th_ed.pdf> [31st March 2015]

Lopez, J. and Potter, G. (eds.) (2001) *After Postmodernism: An Introduction to Critical Realism.* London: The Athlone Press

Love, N. (2006) *Federal Emergency Management Policy Changes After Hurricane Katrina: A Summary of Statutory Provisions*. Washington D.C.: Congressional Research Service - Government & Finance Division

Lovekamp, W. E. (2009) 'Book Review: Response to Disaster: Fact Versus Fiction and its Perpetuation'. *International Journal of Mass Emergencies and Disasters* 27 (1), 96-98

Lubetkin, S. (2014) *50 Researchers from 10 Universities Gather in Troy NY for CCICADA's Annual Research Retreat in may 2014* [online] available from <http://www.ccicada.org/2014/05/01/50-researchers-from-10-universities-gather-in-troy-ny-for-ccicadas-annual-research-retreat/> [July 28th 2014]

Luvaas, J. (1995) *Military History: Is it Still Practicable?*.: U.S. Army War College

MacLean, L. M., Meyer, M., and Estable, A. (2004) 'Improving Accuracy of Transcripts in Qualitative Research'. *Qualitative Health Research* 14 (1), 113-123

Macnaghten, P. and Myers, G. (2002) 'Focus Groups'. in *Qualitative Research Practice*. ed. by Seale, C. and Gobo, G. London UK: Sage Publications, 65-79

Magsino, S. L. (2009) *Applications of Social Network Analysis for Building Community Disaster Resilience*. Washington D.C., US: The National Academies Press

Maine Emergency Management Agency (2015) *Welcome to the Maine Emergency Management Agency - our Mission* [online] available from <http://www.maine.gov/mema/> [January 2nd 2015]

Maine Emergency Management Agency (2014) *About MEMA* [online] available from <http://www.maine.gov/mema/mema_about.shtml> [August 20th 2014]

Malinski, V. (2009) 'Metaphor: Creative Energy Informing Nursing Research'. *Nursing Science Quarterly* 22 (4), 310-311

Malkin, B. (2007) *Oil Platform Evacuated due to a Fire - Telegraph Online* [online] available from <http://www.telegraph.co.uk/news/uknews/1560266/Oil-platform-evacuated-due-to-fire.html> [27th January 2016]

Management Study Guide (2013) *Continuum of Leadership Behaviour* [online] available from <http://www.managementstudyguide.com/continuum-leadership-behaviour.htm> [March 26th 2015]

Manchester Metropolitan University (2005) *Soft Systems Methodology* [online] available from <http://people.cs.aau.dk/~jeremy/resources%20files/SSMhandout.pdf> [February 20th 2016]

Mandelstam, M., (2007) *Betraying the NHS Health Abandoned*. London: Jessica Kingsley Publishers

Manyena, B. (ed.) (2014) *International Disaster Concern Guest Lecture Series*. 'Disaster Resilience in Environmental Geography and Disaster Studies'. held 29th January at Coventry University. Coventry Universtiy: IDC

Manyena, B. (2006) 'The Concept of Resilience Revisited'. *Disasters* 30 (4), 434-450

Marsar, S. (2013) *Camaraderie in the Firehouse: The Element of Camaraderie and how it can Turn a Forestation into a Firehouse*. [10th February 2013 2013] available from <http://www.firefighternation.com/article/professional-development/camaraderie-firehouse> [8th April 2015]

Martin, G. (2015) *Understanding Homeland Security*. 1st edn. Thousand Oaks, California, US: Sage Publications

Martin, J. (1992) *Cultures in Organizations Three Perspectives*. Oxford, UK: Oxford University Press

Martin, W. E. and Bridgmon, K. D. (2012) *Research Methods for the Social Sciences, Volume 42 : Quantitative and Statistical Research Methods : From Hypothesis to Results* [online] . Somerset, NJ, USA: John Wiley & Sons. available from <http://site.ebrary.com/lib/coventry/docDetail.action?docID=10580219&ppg=1> [7th August 2014]

Maryland Emergency Management Agency (N.D.) *NIMS/ICS Compliance - Compliance Who is Responsible for it?* [online] available from <http://mema.maryland.gov/community/Pages/NIMSICSCompliance.aspx> [July 21st 2015]

Maryland Emergency Management Agency (2015) *Mission* [online] available from <http://mema.maryland.gov/Pages/AboutMEMA.aspx> [January 2nd 2015]

Mason, C. (2012) 'London 2012: What Exactly is a COBRA Meeting?'. *BBC News* 23rd July

Massachusetts Department of Fire Services (2005) *Implementation Plan for State and Local Level National Incident Management Systems (NIMS)* [online] available from <http://www.mass.gov/eopss/docs/dfs/emergencyresponse/nims/nims-implementation-plan.pdf> [February 24th 2014]

Maxwell, J. A. (2005) *Qualitative Research Design: An Interactive Approach*. 2nd edn. London UK: Sage Publications

May, P. J. (1985) 'FEMA's Role in Emergency Management: Examining Recent Experience'. *Public Administration Review* 45 (Jan), 40-48

May, T. (2011) *Social Research* [online] 4th edn. Berkshire, GBR: McGraw-Hill Education. available from

<http://site.ebrary.com/lib/coventry/docDetail.action?docID=10481018&ppg=90> [20th August 2014]

McAleavy, T. (2010) 'Facing Disaster with Wide-Area Emergency Preparedness'. *Resilience* (August 2010), 50-53

McAleavy, T. (2006) *Hurricane Katrina: Risk, Hazard and a Command and Control Disaster*. MSc Paper edn. Newcastle, UK: Northumbria University

McAleavy, T. (2005) *A Critique of the North East Ambulance Service Major Incident Medical Management & Support - MIMMS Emergency Plan*. MSc Paper edn. Newcastle, UK: Northumbria University

McAllister, C. P., Ellen III, B. P., Perrewé, P. L., Ferris, G. R., and Hirsch, D. J. (2015) 'Checkmate: Using Political Skill to Recognize and Capitalize on Opportunities in the 'game' of Organizational Life'. *Business Horizons* 58 (1), 25-34-34

McAuley, J., Duberley, J., and Johnson, P. (2006) *Organizations Theory Challenges and Perspectives*. 1st edn. Harlow, England: Prentice Hall

McCabe, C. and Timmins, F. (2005) 'How to Conduct an Effective Literature Search'. *Nursing Standard* 20 (11), 41

McConnell, A. (2003) 'Overview: Crisis Management; Influences, Responses and Evaluation'. *Parliamentary Affairs* 56 (3), 363-409

McCulloh, I., Armstrong, H., and Johnson, A. (2013) *Social Network Analysis with Applications*. Hoboken, New Jersey, US: Wiley

McDermott, A. (2008) *The Hunt for Atlantis*. London UK: Headline

McDonald, S. (2005) 'Studying Actions in Context: A Qualitative Shadowing Method for Organisational Research'. *Qualitative Research* 5 (4), 455-473

McElreath, D. H., Jensen, C. J., Wigginton, M., Doss, D. A., Nations, R., and Van Slyke, J. (2007) *Introduction to Homeland Security*. 2nd edn. Boca Raton, Florida, US: CRC Press

McEntire, D. A., Kelly, J., Kendra, J. M., and Long, L. C. (2013) 'Spontaneous Planning After the San Bruno Gas Pipeline Explosion: A Case Study of Anticipation and Improvisation during Response and Recovery Operations'. *Journal of Homeland Security and Emergency Management* 10 (1)

McEntire, D. A. (2015) *Disaster Response and Recovery: Strategy and Tactics for Resilience*. 2nd edn. Hoboken, New Jersey, US: Wiley

McEntire, D. A. (ed.) (2010) *Comparative Emergency Management: Understanding Policies, Organizations and Initiatives from Around the World.* 1st edn. Emmitsburg, MD, US: Emergency Management Institute

McEntire, D. A. (2008) *Disaster Management Research Discussion Personal Email Communication* [type of communication] to McAleavy, A. [27th November 2008]

McEntire, D. A. (2007) *Disaster Response & Recovery*. Hoboken: John Wiley & Sons

McEntire, D. A. and Mathis, S. (2007) 'Comparative Politics and Disasters: Assessing Substantive and Methodological Contributions'. in *Disciplines, Disasters, and Emergency Management*. ed. by McEntire, D. A. Springfield, Illinois, US: Charles C. Thomas, 178-195

McEntire, D. A. (ed.) (2004) *Federal Emergency Management Agency Higher Edcation Conference*. 'The Status of Emergency Management Theory: Issues, Barriers, and Recommendations for Improved Scholarship'. held 8th June at Emmitsburg, Maryland, US. Emmitsburg< Maryland, US: Federal Emergency Management Agency

McEwan, L. and Jones, O. (eds.) (2012) *11th British Hydrological Society, National Hydrology Symposium*. 'Building local/lay Flood knowledge's into Community Flood Resilience Planning After the July 2007 Floods, Gloucestershire, UK'. held 9th-11th July at Univerity of Dundee, Scotland, UK. Online

McKie, R. (2015) *UK Floods: Hundreds Flee as Swaths of Northern England Submerged* [online] available from <http://www.theguardian.com/environment/2015/dec/26/hundreds-flee-their-homes-as-englands-north-is-submerged> [January 3rd 2016]

McLeod, S. (2013) *Erik Erikson* [online] available from <http://www.simplypsychology.org/Erik-Erikson.html> [April 8th 2015]

McMaster, R. and Baber, C. (2012) 'Multi- Agency Operations: Cooperation during Flooding'. *Applied Ergonomics* 43 (1), 38-47

Medic 911 (2014) *About: Medic 911 - Mecklenburg County Emergency Medical Services* [online] available from <https://www.medic911.com> [August 11th 2014]

Meister, J. (2015) *Job Hopping is the "New Normal" for Millennials: Three Ways to Prevent a Human Resource Nightmare*. http://www.forbes.com/sites/jeannemeister/2012/08/14/job-hopping-is-the-new-normal-for-millennials-three-ways-to-prevent-a-human-resource-nightmare/ edn. Online: Forbes - Leadership

Mener, A. S. (2007) *Disaster Response in the United States of America: An Analysis of the Bureaucratic and Political History of a Failing System*. http://repository.upenn.edu/cgi/viewcontent.cgi?article=1068&context=curej edn. Online: University of Pennsylvania: College Undergraduate Research Electronic Journal - CUREJ

Meteorology Office (2013) *Beaufort Wind Force Scale* [online] available from <http://www.metoffice.gov.uk/guide/weather/marine/beaufort-scale> [October 8th 2014]

Michaelson, G. A. (2001) *Sun Tzu: The Art of War for Managers; 50 Strategic Rules*. 1st edn. Avon U.S.A: Adams Media

Mikkelson, B. and Mikkelson, D. (1995) *Ring Around the Rosie*.

Mileti, D. S. (1999) *Disasters by Design : A Reassessment of Natural Hazards in the United States*. Washington, DC: Joseph Henry Press

Mileti, D. S. (1983) 'Societal Comparisons of Organizational Response of Organizational Response to Earthquake Prediction'. *International Journal of Mass Emergencies and Disasters* 1 (3), 399-413

Mills, J., Bonner, A., and Francis, K. (2006) 'The Development of Constructivist Grounded Theory'. *International Journal of Qualitative Methods* 5 (1), 25-35

Minnesota Department of Public Safety (2014) *About the State Emergency Operations Center - SEOC* [online] available from <https://dps.mn.gov/divisions/hsem/seoc/Pages/about-seoc.aspx> [January 3rd 2015]

Mishler, E. G. (1986) *Research Interviewing : Context and Narrative* [online] . Cambridge, MA, USA: Harvard University Press. available from <http://site.ebrary.com/lib/coventry/docDetail.action?docID=10331331&ppg=69> [7th August 2014]

Moeller, B. J. (2008) 'National Incident Management System: Bringing Order to Chaos'. in *Disaster Management Handbook*. ed. by Pinkowski, J. London: CRC Press, 353-363

Molnau, D. (N.D.) *High Performance Teams: Understanding Team Cohesiveness* [online] available from <http://www.isixsigma.com/implementation/teams/high-performance-teams-understanding-team-cohesiveness/> [July 1st 2015]

Monahan, R. and Beaumont, E. H. (2006) *Big Time Security*. http://www.forbes.com/2006/08/02/homeland-security-contracts-cx_rm_0803homeland.html edn. Online: Forbes

Moore, G. H. (1994) 'My Practical Experience in Emergency Management'. *Disaster Prevention and Management* 5 (4), 23-27

Moore, R. (2004) *Task Force Dagger: The Hunt for Bin Laden*. London: Pan Books

Morgan, G. (2007) *Images of Organisations*. London: Sage Publications

Morimoto, R. (2012) 'Shaking Grounds, Unearthing Palimpsests: Semiotic Anthropology of Disaster'. *Semiotica* 2012 (192), 263-274

Morrison, K. (2006) *Paulison to Get Top FEMA Job - Continuity Central* [online] available from <http://www.continuitycentral.com/news02487.htm> [January 7th 2015]

Moser, K., S. (2000) 'Metaphor Analysis in Psychology - Method, Theory, and Fields of Application'. *Forum Qualitative Sozialforschung* 1 (2), Art 21

Moss, D. (1999) 'Courting Disaster? the Transformation of Federal Disaster Policy since 1803'. in *The Financing of Catastrophic Risk*. ed. by Froot, K. A. Chicago, Illinois, US: University of Chicago Press, 307-362

Moynihan, D. P. (2009) 'The Network Governance of Crisis Response: Case Studies of Incident Command Systems'. *Journal of Public Administration Research and Theory* 19 (4), 895-915

Moynihan, D. P. (2008) 'Combining Structural Forms in the Search for Policy Tools: Incident Command Systems in U.S. Crisis Management'. *Governance: An International Journal of Policy, Administration, and Institutions* 21 (2), 205-229

Moynihan, D. P. (2007) *From Forest Fires to Hurricane Katrina: Case Studies of Incident Command Systems*. The IBM Centre for the Business of Government: Networks and Partnerships Series

Moynihan, D. P. (2005) *Leveraging Collaborative Networks in Infrequent Emergency Situations*. The IBM Centre for the Business of Government: Networks and Partnerships Series

Murray, S. (2000) *Legionnaire: An Englishman in the French Foreign Legion*. 2nd Ed edn. London: Macmillan Publishers

Muskat, M., Blackman, D., and Muskat, B. (2012) 'Mixed Methods: Combining Expert Interviews, Cross-Impact Analysis and Scenario Development'. *The Electronic Journal of Business Research Methods* 10 (1), 9-21

Nagel, K. (2014) *All Hazards Planning* [online] available from <http://www.wright.edu/emergency-management/all-hazards-planning> [13th October 2014 2014]

National Ambulance Resilience Unit (N.D.) *Emergency Services Interoperability at Incidents* [online] available from <https://www.google.co.uk/search?q=preservation+of+life%2C+property+and+the+environment&rlz=1C1EODB_enGB519GB554&oq=preservation+of+life%2C+property+and+the+environment&aqs=chrome..69i57.838j0j4&sourceid=chrome&es_sm=93&ie=UTF-8> [March 26th 2015]

National Arts Centre (N.D.) *Visual Metaphor* [online] available from <http://www.artsalive.ca/collections/posters/pdf/en/ArtsAlive_visualmetaphor_e.pdf> [September 3rd 2014]

National Emergency Management Association (2014a) *Emergency Management Assistance Compact* [online] available from <http://www.emacweb.org> [August 11th 2014]

National Emergency Management Association (2014b) *The Emergency Management Assistance Compact - A History and Analysis of the Evolution of National Mutual Aid Policy and Operations* [online] available from <http://www.emacweb.org/index.php/mutualaidresources/emac-library/5/285-emac-a-history-and-analysis-of-the-evolution-of-national-mutual-aid-policy-and-operations/file> [January 3rd 2015]

National Emergency Management Association (2006) *Post Katrina Emergency Management Reform Act* [online] available from <Post Hurricane Katrina Reform Act> [http://www.nemaweb.org/index.php?option=com_content&view=article&id=170&Itemid=403 2014]

National Oceanic and Atmospheric Administration (2014) *National Hurricane Center - Saffir-Simpson Hurricane Scale* [online] available from <http://www.nhc.noaa.gov/aboutsshws.php> [October 8th 2014]

National Oceanic and Atmospheric Administration (2012a) *Storm Summary for Superstorm Sandy* [online] available from <http://www.erh.noaa.gov/phi/storms/10292012.html> [September 15th 2014]

National Oceanic and Atmospheric Administration (2012b) *Hurricanes in History - National Weather Service, National Hurricane Center* [online] available from <http://www.nhc.noaa.gov/outreach/history/#katrina> [January 5th 2015]

National Oceanic and Atmospheric Administration (2011) *Storm Prediction Center - the Enhanced Fujita Scale (EF Scale)* [online] available from <http://www.spc.noaa.gov/efscale/> [October 8th 2014]

National Police Improvement Agency (2009a) *Guidance on Command and Control* [online] available from <http://www.acpo.police.uk/documents/crime/2009/200907CRICCG01.pdf> [September 3rd 2014]

National Police Improvement Agency (2009b) *Guidance on Multi-Agency Interoperability* [online] available from <http://www.cfoa.org.uk/download/13868> [April 8th 2015]

Navarro, M. J., Panopio, J. A., Bae Malayang, D., and Amano J, N. (2011) 'Print Media Reportage of Agricultural Technology in the Philippines: A Decade's (2000-2009) Analysis of news Coverage and Framing'. *Journal of Science Communication* 10 (3), 1-12

Neal, D. M. (ed.) (2014) *Disaster Research Center 50th Anniversary*. 'Disaster Science and Emergency Management'. held 30th April - 3rd May 2014 at University of Delaware, Newark, US. Online: Disaster Research Center

Neal, D. M. and Webb, G. (2006) 'Structural Barriers to Implementing the National Incident Management System'. in *Learning from Catastrophe: Quick Response Research in the Wake of Hurricane Katrina*. ed. by Bevc, C. University of Colorado, Boulder, Colorado, US: Natural Hazards Center, 263-284

Neal, D. M. (1997) 'Reconsidering the Phases of Disaster'. *International Journal of Mass Emergencies and Disasters* 15 (2), 239-264

Neal, D. M. and Philips, B. D. (1995) 'Effective Emergency Management: Reconsidering the Bureaucratic Approach'. *Disasters* 19 (4), 327-337

Neal, D. M. (ed.) (1993) *Proceedings of the 1993 National Earthquake Conference*. 'Emergency Response Philosophy of the Federal Response Plan: Implications in the Case of a Catastrophic Disaster'. held 2nd-5th May at Memphis, Tennessee, US. Memphis, Tennessee, US: Central United States Earthquake Consortium

Neev, D. and Emeery, K. O. (1995) *The Destruction of Sodom, Gomorrah, and Jericho Geological, Climatological, and Archaeological Background*. New York: New York : Oxford University Press

Neuendorf, K. A. (2002) *The Content Analysis Guidebook*. London, UK: Sage Publications

Neusner, J. (2004) *Confronting Creation: How Judaism Reads Genesis*. Reprint edn. Eugene, Oregon, US: Wipf & Stock Publishing

New York City Fire Department (2010) *Firefighter Radio Failure* [online] available from <http://www.firefighterradiofailure.com/index.html> [August 28th 2010]

New York City Fire Department (2003) *Mission Statement of the New York City Fire Department* [online] available from <http://www.nyc.gov/html/fdny/html/general/mission.shtml> [July 29th 2013]

New York City Fire Department (2002) *McKinsey Report - Increasing FDNY's Preparedness*. New York US: New York City Fire Department

New York Post (2015) *Baltimore Chants "no Justice, no Peace, no Racist Police"* [online] available from <http://nypost.com/2015/05/02/baltimore-chants-no-justice-no-peace-no-racist-police/> [July 1st 2015]

New York State Division of Homeland Security and Emergency Services (2015) *Emergency Management* [online] available from <http://www.dhses.ny.gov> [January 2nd 2015]

Nisula, A., Kallio, A., Oikarinen, T., and Kianto, A. (2015) 'Fostering Team Creativity and Innovativeness with Playfulness: A Multi-Case Study'. *International Journal of Innovation and Learning* 17 (1), 79-97

North Atlantic Treaty Organisation (2006) *Interoperability for Joint Operations* [online] available from <http://www.nato.int/nato_static_fl2014/assets/pdf/pdf_publications/20120116_interoperability-en.pdf> [April 8th 2015]

North Dakota Department of Emergency Services (2015) *Incident Management Assistance Teams* [online] available from <http://www.nd.gov/des/homeland/imat/> [January 3rd 2015]

North East Ambulance Service (2011) *Hazardous Area Response Team* [online] available from <https://www.neas.nhs.uk/our-services/emergency-planning/hazardous-area-response-team-(hart).aspx> [July 15th 2015]

Northern Echo Online (2010) *Stiller Warehousing and Distribution Destroyed* [online] available from <http://www.thenorthernecho.co.uk/news/8621887.Crews_tackled_200ft_flames/> [January 27th 2016]

Northumbria Local Resilience Forum (2012) *Handbook for Category One and Two Responders 2010-12* [online] available from <file:///C:/Users/ab3426/Downloads/Revised%20Structure%20v3%2020101214.pdf> [November 6th 2014]

Northumbria University (2014a) *The Disaster and Development Centre Online* [online] available from <http://www.disasteranddevelopmentcentre.co.uk/who-are-we/> [September 11th 2014]

Northumbria University (2014b) *The Disaster and Development Network* [online] available from <https://www.northumbria.ac.uk/about-us/academic-departments/geography/research/geography-research/disaster-development-network-ddn/> [October 22nd 2014]

Nova Scotia Communities, Culture & Heritage (2012) *Titanic in Nova Scotia: Halifax Connection* [online] available from <http://www.novascotia.ca/titanic/connection.asp> [October 20th 2014]

Nowell, B. and Steelman, T. (2015) 'Communications Under Fire: The Role of Embeddedness in the Emergence and Efficacy of Disaster Response Communications Networks'. *Journal of Public Administration Research and Theory* 25 (3), 929-952

Oates, B. J. and Fitzgerald, B. (2007) 'Multi-Metaphor Method: Organisational Metaphors in Information Systems Development'. *Information Systems Journal* 17 (4), 421-449

O'Brien, G. (ed.) (2007) *The Belfast Solicitor's Association Continuing Professional Development Programme*. 'UK Emergency Preparedness - Prepared for what?'. held 19th October 2007 at Belfast

O'Brien, G. (2006) 'UK Emergency Preparedness: A Step in the Right Direction?'. *Journal of International Affairs* 59 (2), 63-85

O'Brien, G. and Read, P. (2005) 'Future UK Emergency Management: New Wine, Old Skin?'. *Disaster Prevention and Management* 14 (3), 353-361

Office of the First Minister and Deputy First Minister (2005) *The Northern Ireland Civil Contingencies Framework* [online] available from <http://www.ofmdfmni.gov.uk/nicivilcontingenciesframework.pdf> [November 6th 2014]

Office of the Governor Rick Perry (2014) *Office of the Governor - Rick Perry - Initiatives: Disaster Preparedness* [online] available from <http://governor.state.tx.us/initiatives/disasters/> [January 2nd 2015]

O'Leary, R. and Blomgren-Bingham, L. (eds.) (2009) *The Collaborative Public Manager: New Ideas for the Twenty First Century.* Washington D.C. US: Georgetown University Press

Olofsson, A. (2007) 'The Preparedness of Local Authorities for Crisis Communications with People Who have Foreign Backgrounds: The Case of Sweden'. *International Journal of Mass Emergencies and Disasters* 25 (2), 145-173

Olsen, W. (2009) *Realist Methodology: A Review (Benchmarks in Social Research Methods)* [online] available from <https://www.escholar.manchester.ac.uk/api/datastream?publicationPid=uk-ac-man-scw:75773&datastreamId=SUPPLEMENTARY-1.PDF> [June 9th 2014]

Olympus (2014) *VN-711 PC DNS* [online] available from <http://www.olympus.co.uk/site/en/a/audio_systems/audio_recording/notetakers/vn_711pc_dns_1/index.html> [August 11th 2014]

Opie, I. and Opie, P. (1951) *The Oxford Dictionary of Nursery Rhymes*. 2nd edn. Oxford, UK: Oxford University Press

Ordnance Survey (2015) *Map Symbol Guide* [online] available from <http://www.ordnancesurvey.co.uk/resources/maps-and-geographic-resources/map-symbols.html> [June 4th 2015]

O'Riordan, P. (1992) *Emergency Planning in Ireland*. Dublin, Ireland: Institute of Public Administration

Ortiz, M. J. (2011) 'Primary Metaphors and Monomodal Visual Metaphors'. *Journal of Pragmatics* 43, 1265-1580

Ortony, A. (ed.) (1998) *Metaphor and Thought.* 2nd edn. Cambridge, U.K.: Cambridge University Press

Ortony, A. (1979) 'Some Psycholinguistic Aspects of Metaphor'. *University of Illinois* Technical Report (112), 1-44

Overseas Development Institute (2015) *Adapting Incident Command to Humanitarian Response* [online] available from <http://www.odi.org/events/4126-adapting-incident-command-systems-humanitarian-response> [March 19th 2015]

Palombo, J., Bendicsen, H. K., and Kock, B. J. (2009) *A Guide to Psychoanalytic Developmental Theories* [online] available from <http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=17&ved=0CEIQFjAGOAo&url=http%3A%2F%2Fwww.springer.com%2Fcda%2Fcontent%2Fdocument%2Fcda_downloaddocument%2F9780387884547-p1.pdf%3FSGWID%3D0-0-45-742398-p173849316&ei=v7MiVcWzKMKt7Ab4u4DwBw&usg=AFQjCNEyP_z3Vwk_llM1M-u-96iLUFNUgw&bvm=bv.89947451,d.ZGU> [April 6th 2015]

Panov, D. G. (2001) 'Editor's Foreword'. in *Atlantis - Atlantology: Basic Problems*. ed. by Panov, D. G. Honolulu, Hawaii: University Press of the Pacific, 5

Parris, B. (2004) *The Making of a Legionnaire*. London: Orion Publishing Group

Pearce, T. and Fortune, J. (1995) 'Command and Control in Policing: A Systems Assessment of the Gold, Silver and Bronze Structure'. *Journal of Contingencies & Crisis Management* 3 (3), 181-187

Penna, A. N. (2013) *Natural Disasters in a Global Environment*. Hoboken, New Jersey US: Hoboken : Wiley

Penuel, K. B., Statler, M., and Hagen, R. (eds.) (2013) *Encyclopedia of Crisis Management.* Thousand Oaks, California, US: Sage Publications

Perrow, C. (2011) *The Next Catastrophe: Reducing our Vulnerabilities to Natural, Industrial and Terrorist Disasters*. Princeton, NJ: Princeton, NJ : Princeton University Press

Perrow, C. (2006) 'The Disaster After 9/11:The Department of Homeland Security and the Intelligence Reorganisation'. *Homeland Security Affairs* 11 (1), 1-32

Perrow, C. (1999) *Normal Accidents: Living with High-Risk Technologies*. Princeton, NJ: Princeton, NJ : Princeton University Press

Perry, R. W. and Quarantelli, E. L. (2005a) 'Introduction'. in *What is Disaster? New Answers to Old Questions*. ed. by Perry, R. W. and Quarantelli, E. L. US: Xlibris Corporation, 19-21

Perry, R. W. and Quarantelli, E. L. (eds.) (2005b) *What is Disaster? New Answers to Old Questions.* US: Xlibris Corporation

Perry, R. W. (2003) 'Incident Management Systems in Disaster Management'. *Disaster Prevention and Management* 12 (5), 405-412

Perry, R. W. and Lindell, M. (2003) 'Understanding Citizen Response to Disasters with Implications for Terrorism'. *Journal of Contingencies and Crisis Management* 11 (2), 49-60

Perry, R. W. and Hirotada, H. (1983) 'Volcanic Eruptions and Functional Change: Parallels in Japan and the United States'. *International Journal of Mass Emergencies and Disasters* 1 (2), 399-413

Peters, G. and Wooley, J. T. (2015) *486 - Statement on Signing the Disaster Relief Act of 1970 - December 31 1970 - the American Presidency Project Online* [online] available from <http://www.presidency.ucsb.edu/ws/?pid=2875> [June 1st 2015]

Peters, G. and Wooley, J. T. (2014a) *Executive Order 10186 - Establishing the Federal Civil Defense Administration in the Office for Emergency Management of the Executive Office of the President - the American Presidency Project Online* [online] available from <http://www.presidency.ucsb.edu/ws/?pid=78352> [December 8th 2014]

Peters, G. and Wooley, J. T. (2014b) *149 - Statement about the Disaster Relief Act of 1974 by President Richard Nixon - may 22 1974 - the American Presidency Project Online* [online] available from <http://www.presidency.ucsb.edu/ws/?pid=4218> [December 10th 2014]

Peters, G. and Wooley, J. T. (2014c) *Federal Emergency Management Agency Remarks Announcing Reorganization Plan no 3 of 1978 - the American Presidency Project Online* [online] available from <http://www.presidency.ucsb.edu/ws/?pid=30970> [December 16th 2014]

Peters, G. and Wooley, J. T. (2014d) *William J. Clinton - Statement on Signing the Antiterrorism and Effective Death Penalty Act of 1996 - April 24, 1996* [online] available from <http://www.presidency.ucsb.edu/ws/?pid=52713> [December 22nd 2014]

Peyton, B. (2012) *Journey to the Mysterious Island*. Los Angeles, US: Warner Brothers

Phellas, C. N., Bloch, A., and Seale, C. (2011) *Structured Methods: Interviews, Questionnaires and Observation* [online] available from <http://www.sagepub.com/upm-data/47370_Seale_Chapter_11.pdf> [June 13th 2014]

Phillips, C. and Rawlinson, K. (2015) 'Paris Attacks Kill More than 10 People - as it Happened'. *Guardian* 14th November: Online

Phillips, D. C. (1995) 'The Good, the Bad and the Ugly: The Many Faces of Constructivism'. *Educational Researcher* 24 (7), 5-12

Phillips, E. M. and Pugh, D. S. (2007) *How to Get a PhD - A Handbook for Students and their Supervisors*. 4th edn. Maidenhead, UK: McGraw-Hill

Phillips, M., Saunders, P., and Thornhill, A. (2006) *Research Methods for Business Students*. 4th edn. Harlow: Prentice Hall

Pidgeon, N. and O'Leary, M. (2000) 'Man-made Disasters: Why Technology and Organizations (Sometimes) Fail'. *Safety Sciences* 34 (1-3), 15-30

Pink, S. (ed.) (2012) *Advances in Visual Methodology.* 1st edn. London: Sage Publications

Pitt, M. (2008) *Learning Lessons from the 2007 Floods (the Pitt Review)*. London: Cabinet Office

Pleins, J. D. (2010) *When the Great Abyss Opened Classic and Contemporary Readings of Noah's Flood*. New York ; Oxford: New York ; Oxford : Oxford University Press

Plotnick, L., Gomez, E. A., White, C., and Turoff, M. (eds.) (2007) *Information Systems for Crisis and Response Management - ISCRAM 2007*. 'Furthering Development of a Unified Emergency Scale using Thurstone's Law of Comparative Judgement: A Progress Report'. held 13th - 16th May at Delft University of Technology, the Netherlands. The Netherlands: ISCRAM

Poland, B. D. (1995) 'Transcription Quality as an Aspect of Rigor in Qualitative Research'. *Qualitative Inquiry* 1 (3), 290-310

Pollock, K. (2015) *Interoperability Theory and Practice in UK Emergency Management*. Emergency Planning College Occasional Papers New Series - No: 13: Cabinet Office

Pollock, K. (2013) *Review of Persistent Lessons Identified Relating to Interoperability from Emergencies and Major Incidents since 1986*. Emergency Planning College Occasional Papers New Series - No: 6: Cabinet Office

Pontzer-Ehrhardt, V. (2011) *Anthem Critical Thinking and Writing Skills: An Introductory Guide*. London: Anthem Press

Porfiriev, B. N. (1998) 'Issues in the Definition and Delineation of Disasters and Disaster Areas'. in *What is Disaster?: Perspectives on the Question*. ed. by Quarantelli, E. L. London UK: Routledge, 56-72

Powell, J. W. (1954) *An Introduction to the Natural History of Disaster*. College Park Maryland US: University of Maryland Disaster Research Project

Price, M. (2007) *Emergency Management, USA State Emergency Management Agency Web Sites* [online] available from <http://www.emergencymanagement.org/states/> [January 2nd 2015]

Prince, S. H. (1920) *Catastrophe and Social Change , Based upon a Sociological Study of the Halifax Disaster (Columbia University Studies in the Social Sciences, no 212)*. New York: Ams PR

Prosser, J. (2011) 'Visual Methodology: Towards a More Seeing Research'. in *The SAGE Handbook of Qualitative Research*. ed. by Denzin, N. and Lincoln, Y. London: Sage, 479-488

Public Safety Canada and U.S. Department of Homeland Security (2012) *Compendium of U.S. - Canadian Emergency Management Assistance Mechanisms* [online] available from <http://www.dhs.gov/xlibrary/assets/policy/btb-compendium-of-us-canada-emergency-management-assistance-mechanisms.pdf> [August 11th 2014]

Public Safety Canada (2011) *Issues in the Definition and Delineation of Disasters and Disaster Areas an Emergency Management Framework for Canada - Second Edition - Ministers Responsible for Emergency Management* [online] available from <http://www.publicsafety.gc.ca/cnt/rsrcs/pblctns/mrgnc-mngmnt-frmwrk/mrgnc-mngmnt-frmwrk-eng.pdf> [November 3rd 2014]

Putnam, H. (1987) *The Many Faces of Realism*. La Salle: Open Court

Quarantelli, E. L. (2006) *Catastrophes are Different from Disasters: Some Implications for Crisis Planning and Managing Drawn from Hurricane Katrina*. Delaware: Social Science Research Council

Quarantelli, E. L. (2005) 'A Social Science Research Agenda for the Disasters of the 21st Century: Theoretical, Methodological and Empirical Issues and their Professional Implementation'. in *What is a Disaster?: New Answers to Old Questions*. ed. by Perry, R. W. and Quarantelli, E. L. Philadelphia US: Xlibris, 325-396

Quarantelli, E. L. (2002) *Letter to Dr O'Leary: Here is a Statement about the Incident Command System* [type of communication] to O'Leary, M. R. [Available from the E.L. Quarantelli Resource Collection, Disaster Research Center, University of Delaware 2002]

Quarantelli, E. L. (1998) *What is a Disaster?: Perspectives on the Question*. London New York: Routledge

Quarantelli, E. L. (1997) *The Disaster Research Center (DRC) Field Studies of Organised Behaviour in the Crises Time Period of Disasters - Preliminary Paper # 254*. Preliminary Paper # 254 edn. University of Delaware: Disaster Research Center

Quarantelli, E. L. (1993) 'Converting Disaster Scholarship into Effective Disaster Planning and Managing: Possibilities and Limitations'. *International Journal of Mass Emergencies and Disasters* 11 (1), 15-39

Quarantelli, E. L. (1988) 'Disaster Crisis Management: A Summary of Research Findings'. *Journal of Management Studies* 25 (4), 373-385

Quarantelli, E. L. (1986) *Disaster Studies: An Historical Analysis of the Influences of Basic Sociology and Applied use on the Research done in the Last 35 Years - Preliminary Paper # 111*. Preliminary Paper # 111 edn. University of Delaware: Disaster Research Center

Quarantelli, E. L. (1982) 'What is a Disaster? an Agent Specific Or an all Disaster Spectrum Approach to Socio-Behavioral Aspects of Earthquakes'. in *Social and Economic Aspects of Earthquakes*. ed. by Jones, B. and Tomazevic, M. Ithaca NY US: Cornell University, 453

Quarantelli, E. L. (1978) *Disasters: Theory and Research*. London ; Beverly Hills, Calif.: Sage Publications

Quarantelli, E. L. and Dynes, R. R. (1977) 'Response to Social Crisis and Disaster'*. Annual Review of Sociology* 3, 23-49

Radvanovsky, R. and McDougall, A. (2013) *Critical Infrastructure: Homeland Security and Emergency Preparedness*. 3rd edn. Boca Raton, Florida, US: CRC Press

Rake, E. L. and Njå, O. (2009) 'Perceptions and Performances of Experienced Incident Commanders'*. Journal of Risk Research* 12 (5), 665-685

Ramadurai, S., Lloyd, D., Wallis, M., and Wickramasinghe, N. C. (1995) 'Extinction of Dinosaurs: A Possible Novel Cause'*. Advances in Space Research* 15 (3), 139-146

Randolph, J. J. (2009) 'A Guide to Writing the Dissertation Literature Review'*. Practical Assessment, Research & Evaluation* (13), Vol.14(13)

Rao, P. S. and Venktram, T. K. (2010) *Management Theory and Practice (Text & Cases)*. New Delhi, India: Himalaya Publishing House

Rapley, T. (2002) 'Interviews'. in *Qualitative Research Practice*. ed. by Seale, C. and Gobo, G. London UK: SAGE Publications, 15-33

Ready Scotland (N.D.) *Resilience Advisory Board for Scotland* [online] available from <http://www.readyscotland.org/ready-government/resilience-advisory-board/> [November 6th 2014]

Regel, S. (2007) 'Post-Trauma Support in the Workplace: The Current Status and Practice of Critical Incident Stress Management (CISM) and Psychological Debriefing (PD) within Organizations in the UK'*. Occupational Medicine* 57 (6), 411-416

Renz, L. M. (2009) 'Metaphor: Imagery Devices used by Morgan to Describe Organizations as Culture and Psychic Prisons'*. Emerging Leadership Journeys* 2 (1), 54-65

Retronyms (2014) *Recorder for IPhone* [online] available from <http://www.recordertheapp.com> [August 11th 2014]

Reuters (2014) *Terrorists Attacks on Americans - 1979-1988* [online] available from <http://www.pbs.org/wgbh/pages/frontline/shows/target/etc/cron.html> [December 24th 2014]

Reynolds, D., (2009) *America, Empire of Liberty a New History of the United States*. New York: New York : Basic Books

Richardson, B. K. (2005) 'The Phases of Disaster as a Relationship between Structure and Meaning: A Narrative Analysis of the 1947 Texas City Explosion'. *International Journal of Mass Emergencies and Disasters* 23 (3), 27-54

Rimstad, R. and Braut, G. S. (In Pres) 'Literature Review on Medical Incident Command'. *Prehospital and Disaster Medicine*

Rivera, J. D. and Miller, D. S. (2006) 'A Brief History of the Evolution of United States' Natural Disaster Policy'. *Journal of Public Management and Social Policy* 12 (1), 5-14

Roberts, P. S. (2006) 'FEMA and the Prospects for Reputation-Based Autonomy'. *Studies in American Political Development* 20 (1), 57-87

Roberts, P. S. (2005) 'What Katrina Means for Emergency Management'. *The Forum* 3 (3), 1-10

Robinson, D. (2014) *Finalising Details for My Upcoming Research Trip (Email)* [type of communication] to McAleavy, T. [23rd June 2014 2014]

Rocco, T. S. and Plakhotnik, M. S. (2009) 'Literature Reviews, Conceptual Frameworks, and Theoretical Frameworks: Terms, Functions, and Distinctions'. *Human Resource Development Review* 8 (1), 120-130

Rockett, J. P. (1994) 'A Constructive Critique of United Kingdom Emergency Planning'. *Disaster Prevention and Management* 3 (1), 47-60

Rodriguez, H., Trainor, J., and Quarantelli, E. L. (2006) 'Rising to the Challenges of a Catatstrophe: The Emergent and Pro-Social Behavior Following Hurricane Katrina'. *The Annals of the American Academy of Political and Social Science* 604 (1), 82-101

Rohn, E. and Blackmore, D. (2009) 'A Unified Localizable Emergency Events Scale'. *International Journal of Information Systems for Crisis Response and Management (IJISCRAM)* 1 (4), 1-14

Ronin, B. (N.D.) *Rohn Emergency Scale* [online] available from <http://roninquest.org/rohn-emergency-scale.html> [13th October 2014 2014]

Rose, G. (2001) *Visual Methodologies : An Introduction to the Interpretation of Visual Materials* [online] . London, GBR: SAGE Publications, Incorporated. available from <http://site.ebrary.com/lib/coventry/docDetail.action?docID=10080966&ppg=14> [7th August 2014]

Roth, L. H., Criss, K., Stewart, X., and McCann, K. (2009) 'Preplink: A Novel Web-Based Tool for Healthcare Emergency Planning and Response'. *Biosecurity and Bioterrorism-Biodefense Strategy Practice and Science* 7 (1), 85-91

Royal United Services Institute (2010) *Command and Control 2010* [online] available from <https://rusi.org/conference/command-and-control-2010> [30th December 2016]

Rubin, C. B. (2009) 'Long Term Recovery from Disasters - the Neglected Component of Emergency Management'. *Journal of Homeland Security and Emergency Management* 6 (4), Article 46 p 1-5

Rugg, G. and Petre, M. (2006) *Gentle Guide to Research Methods*. Buckingham U.K.: McGraw-Hill Education

Sahin, B., Kapucu, N., and Unlu, A. (2008) 'Perspectives on Crisis Management in European Union Countries: United Kingdom, Spain and Germany'. *European Journal of Economic and Political Studies* 1 (1), 19-45

Salmon, P., Jenkins, D., and Walker, G. (2011) 'Coordination during multi-agency Emergency Response: Issues and Solutions'. *Disaster Prevention and Management* 20 (2), 140-158

Sandford, M. (2013) *The Abolition of Regional Government - Parliament and Constitution Centre* [online] available from <file:///C:/Users/ab3426/Downloads/SN05842%20(2).pdf> [October 29th 2014]

Santiago, N. (2009) *Interview Types: Structured, Semi-Structured and Unstructured* [online] available from <http://www.examiner.com/article/interview-types-structured-semi-structured-and-unstructured> [July 30th 2014]

Sarbin, T. R. and Kituse, J. I. (eds.) (1995) *Constructing the Social.* London: SAGE Publications

Saunders, M., Lewis, P., and Thornhill, A. (2008) *Research Methods for Business Students*. 5th edn. London UK: Pearson Education Limited

Saunders, M., Lewis, P., and Thornhill, A. (2007) *Research Methods for Business Students*. 4th edn. Harlow: Pearson Professional Ltd

Saunders, M., Lewis, P., and Thornhill, A. (2012) *Research Methods for Business Students*. 6th edn. Harlow, UK: Pearson

Sayer, A. (1999) *Realism and Social Science*. London: Sage Publications

Scanlon, J. T. (1996) 'Dealing with Mass Death After a Community Catastrophe: Handling Bodies After the 1917 Halifax Explosion'. *Disaster Prevention and Management* 7 (4), 288-304

Scanlon, T., Joseph (2005) 'Forward'. in *What is Disaster? New Answers to Old Questions*. ed. by Perry, R. W. and Quarantelli, E. L. US: Xlibris Corporation, 13-18

Scanlon, T., Joseph (1988) 'Disaster's Little Known Prince: Canada's Samuel Henry Prince '. *International Journal of Mass Emergencies and Disasters* 6 (3), 213-232

Schaafstall, A. M., Johnston, J. H., and Oser, R., L. (2001) 'Training Teams for Emergency Management'. *Computers in Human Behaviour* 17 (5-6), 615-626

Schachtner, C. (2002) 'Images of Health and Disease in Medical Practice: Metaphors as Structuring Elements'. in *Health and Quality of Life: Philosophical, Medical and Cultural Aspects*. ed. by Gimmler, A., Lenk, C., and Aumuller, G. Munster: LIT Ladaq Dr. Wilhelm Hopf, 81-94

Schein, E. H. (2010) *Organizational Culture and Leadership*. 4th edn. Hoboken, New Jersey, US: Wiley

Schein, E. H. (1994) 'Cultures in Organizations: Three Perspectives'. *Administrative Science Quarterly* 39 (2), 339-342

Schenk, G. J. (2007) 'Historical Disaster Research. State of Research, Concepts, Methods and Case Studies'. *Historical Social Research* 32 (3), 9-31

Schneider, S. K. (1998) 'Reinventing Public Administration: A Case Study of the Federal Emergency Management Agency'. *Public Administration Quarterly* 22 (1), 35-57

Schneider, S. K. (1992) 'Governmental Response to Disasters: The Conflict between Bureaucratic Procedures & Emergent Norms'. *Public Administration Review* 52 (2), 135-145

Scholtens, A., Jorritsma, J., and Helsloot, I. (2014) 'On the Need for a Paradigm Shift in the Dutch Command and Information System for the Acute Phase of Disasters'. *Journal of Contingencies & Crisis Management* 22 (1), 39-51

Scholtens, A. (2008) 'Controlled Collaboration in Disaster and Crisis Management in the Netherlands, History and Practice of an Overestimated and Underestimated Concept'. *Journal of Contingencies & Crisis Management* 16 (4), 195-207

Schoomaker, P. (2003) *Field Manual 6-0 Mission Command and Control of Army Forces*. Washington D.C.: The Department of the Army

Schwandt, T. A. (2000) 'Three Epistemological Stances for Qualitative Inquiry: Interpretivism, Hermeneutics and Social Constructionism'. in *Handbook of Qualitative Research*. ed. by Denzin, N. K. and Lincoln, Y. S. Thousand Oaks, Calif: SAGE Publications, 189-213

Schweickart, R. and Kovacs, P. (2008) 'Asteroids: A New Challenge'. *Crisis Response* 1 (5), 36-38

Seale, C. and Gobo, G. (2002) *Qualitative Research Practice* [online] . London, GBR: SAGE Publications. available from <http://site.ebrary.com/lib/coventry/docDetail.action?docID=10668448&ppg=34>

Seale, C. and Silverman, D. (1997) 'Ensuring Rigor in Qualitative Research'. *European Journal of Public Health* 7 (4), 379-84

Shaluf, I. M., Ahmadun, F. l., and Said, A. (2003) 'A Review of Disaster and Crisis'. *Disaster Prevention and Management* 12 (1), 24-32

Shamoun, S. (2009) *Does the Quaran Teach A Local Flood?* [online] available from <http://www.answering-islam.org/Shamoun/flood.htm> [October 15th 2014]

Shaw, D. (2009) *Seminars: Emergency Preparedness for the U.K.* [online] available from <http://www.astoncrisis.com/crisiscms/Seminars-Emergency-Preparedness-for-the-UK> [July 28th 2014]

Shepherd, J. and van Vuuren, K. (2014) 'The Brisbane Flood: CALD Gatekeepers' Risk Communication Role'. *Disaster Prevention and Management* 23 (4), 469-483

Silesti (2014) *The EPS Annual Conference, AGM and Awards Dinner 2014* [online] available from <https://www.the-eps.org/news/the-eps-annual-conference-agm-and-awards-dinner-2014> [July 28th 2014]

Slovis, C. M., Carruth, T. B., Seitz, W. J., Thomas, C. M., and Elsea, W. R. (1985) 'A Priority Dispatch System for Emergency Medical Services'. *Annals of Emergency Medicine* 14 (11), 1055 - 1060

Smith, D. (2005) 'In the Eyes of the Beholder? Making Sense of the System(s) of Disaster(s)'. in *What is a Disaster?: New Answers to Old Questions*. ed. by Perry, R. W. and Quarantelli, E. L. Philadelphia US: Xlibris, 201-236

Smith, G. P. and Wenger, D. (2006) 'Sustainable Disaster Recovery: Operationalizing and Existing Agenda'. in *Handbook of Disaster Research (Handbooks of Sociology and Social Research)*. ed. by Rodríguez, H., Dynes, R. R., and Quarantelli, E. L. Boston, MA: Springer Science, 234-257

Smith, J. (2003) 'Civil Contingency Planning in Government'. *Parliamentary Affairs* 56 (3), 410-422

Sobel, R., Coyne, C., and Leeson, P. (2007) 'The Political Economy of FEMA: Did Reorganization Matter?'. *The Journal of Public Finance and Public Choice* 17 (2-3), 49-65

Social Research Association (2003) *Ethical Guidelines* [online] available from <http://the-sra.org.uk/wp-content/uploads/ethics03.pdf> [September 2014 2014]

Sociology Central (N.D.) *Sociological Research Skills - Focused (Semi-Structured) Interviews* [online] available from <http://www.sociology.org.uk/methfi.pdf> [August 7th 2014]

Solis, G. Y., Hightower, H. C., and Kawaguchi, J. (1997) *Guidelines on Cultural Diversity and Disaster Management*. The Disaster Preparedness Resources Centre The University of British Columbia: Emergency Preparedness Canada

Sopra Steria (2014) *Command and Control: Transforming Call Handling and Citizen Engagement* [online] available from <http://www.soprasteria.co.uk/markets/police/command-control> [March 19th 2015]

Sorokin, P. A. (1942) *Man and Society in Calamity*. 2010th edn. New Brunswick, New Jersey, US: Transaction Publishers

Souhami, A. (2014) 'Institutional Racism and Police Reform: An Empirical Critique'. *Policing and Society* 24 (1), 1-21

Soukhanov, A. (ed.) (1992) *The American Heritage Dictionary of the English Language.* 3rd edn. New York: Houghton Miflin

Spector, M. and Kitsuse, J. I. (1977) *Constructing Social Problems*. California, US: Cummings

Spence, L. (2003) *The History of Atlantis*. 1st edn. New York, US: Dover

Spill Consult (2014) *Incident Management Services* [online] available from <http://www.spillconsult.com/incident-management-services/> [October 25th 2014]

Spolsky, J. (2006) *The Command and Control Management Method*.: Fog Creek Software

St Petersburg College (2015) *Guide to Research using Journal Article: Why Journal Articles?* [online] available from <http://spcollege.libguides.com/whyjournals> [May 26th 2015]

Stainsby, A. (2012) 'Emergency Planning and the UK Civil Contingencies Act 2004'. *Proceedings of the Institution of Civil Engineers: Municipal Engineer* 165 (2), 69-71

Stallings, R. A. (2006) 'Methodological Issues'. in *Handbook of Disaster Research (Handbooks of Sociology and Social Research)*. ed. by Rodríguez, H., Dynes, R. R., and Quarantelli, E. L. Boston, MA: Springer Science, 55-82

Stallings, R. A. (2005) 'Disaster, Crisis, Collective Stress, and Mass Deprivation'. in *What is a Disaster?: New Answers to Old Questions*. ed. by Perry, R. W. and Quarantelli, E. L. Philadelphia US: Xlibris, 237-274

Stallings, R. A. (1995) *Promoting Risk: Constructing the Earthquake Threat*. New York, US: Aldine de Gruyter

Stallings, R. A. and Quarantelli, E. L. (1985) 'Emergent Citizen Groups and Emergency Management'. *Public Administration Review* 45, 93-100-100

Stannard-Gromisch, E. (2010) *Planning Your PhD: Getting Your Research Aim/Question Right*. [16th April 2010] available from <http://www.brighthub.com/education/postgraduate/articles/68825.aspx> [30th April 2014]

State of Maine (2014) *Community Emergency Response Teams* [online] available from <http://www.maine.gov/mema/prepare/prep_display.shtml?163654> [January 7th 2015]

Stationary Office (2005) *Report of the Official Account of the Bombings in London on 7th July 2005* [online] available from <http://news.bbc.co.uk/1/shared/bsp/hi/pdfs/11_05_06_narrative.pdf> [July 25th 2013]

Steen, G. J., Dorst, A. G., Herrmann, J. B., Kaal, A. A., Krennmayr, T., and Pasma, T. (2010) *A Method for Linguistic Metaphor Identification: From MIP to MIPVU* . Amsterdam: John Benjamin Publishing Company

Steen, G. J. (2007) 'MIP: A Method for Identifying Metaphorically used Words in Discourse - Pragglejazz Group'. *Metaphor and Symbol* 22 (1), 1-39

Stehr, S. D. (2001) 'Community Recovery and Reconstruction Following Disasters'. in *Handbook of Emergency Management*. ed. by Farazmand, A. New York, US: Marcel Dekker Inc, 419-431

Steinberg, T. (2006) *Acts of God the Unnatural History of Natural Disaster in America*. 2nd edn. Oxford, UK: Oxford University Press

Steinman, M., Lottenberg, C., Pavao, O. F., Kanamura, A., Aranha, L. F. C., Cenderoglo, M., and Rizzo, L. V. (2012) 'Emergency Response to the Haitian earthquake—As Bad as it Gets'. *Injury* 43 (3), 386-387

Steward, B. (2004) 'Writing a Literature Review'. *British Journal of Occupational Therapy* 67 (11), 495-500

Stoddard, E. R. (1968) *Conceptual Models of Human Behaviour in Disaster*. El Paso, Texas, US: Texas Western Press

Storey, W. (2010) *US Government and Politics*. 2nd edn. Edinburgh: Edinburgh University Press

Strauss, A. and Corbin, J. (1990) *Basics of Qualitative Research: Grounded Theory Procedures and Techniques*. 2nd edn. Newbury Park, California, US: Sage

Stuckey, H. L. (2013) 'Methodological Issues in Social Health and Diabetes Research - Three Types of Interviews: Qualitative Research Methods in Social Health'. *Journal of Social Health & Diabetes* 1 (2), 56-59

Svetlina, M. (2014) 'Resilience in the Context of Erikson's Theory of Human Development'. *Current Psychology* 33 (3), 393-404

Swope, C. and Patton, Z. (2005) *Disaster's Wake*. http://www.governing.com/topics/energy-env/Disaster-Wake.html edn. Online: Governing States and Localities

Sylves, R. T. and Comfort, L. K. (2012) 'The Exxon Valdez and BP Deepwater Horizon Oil Spills: Reducing Risk in Socio-Technical Systems'. *American Behavioral Scientist* 56 (1), 76-103

Sylves, R. T. (2008) *Disaster Policy and Politics: Emergency Management and Homeland Security*. Washington, D.C. US: CQ Press

Tajfel, H. (ed.) (2010) *Social Identity and Intergroup Relations.* Cambridge, UK: Cambridge University Press

Tannenbaum, R. and Schmidt, W. (1973) 'How to Choose a Leadership Style'. *Harvard Business Review* 5 (3), 162-180

Tansel, B. (1995) 'Natural and Manmade Disasters: Accepting and Managing Risks'. *Safety Science* 20 (1), 91-99

Tashakkori, A. and Cresswell, J. W. (2007) 'The New Era of Mixed Methods'. *The Journal of Mixed Methods* 1 (1), 3-7

Taylor, F. W. (1910) *The Principles of Scientific Management - the National Humanities Center Archives* [online] available from <http://nationalhumanitiescenter.org/pds/gilded/progress/text3/taylor.pdf> [April 2015 2015]

Teddie, C. and Tashakkori, A. (2009) *Foundations of Mixed Methods Research: Integrating Quantitative and Qualitative Approaches in the Social Sciences*. Los Angeles: Sage

Teddie, C. and Yu, F. (2007) 'Mixed Methods Sampling: A Typology with Examples'. *Journal of Mixed Methods Research* 1 (1), 77-100

The Gilbreth Network (1968) 'Pioneers in Improvement and our Modern Standard of Living'. *International Work Simplification Institute News* 18 (September), 37-38

Thompson, P. (2000) *Voice of the Past - Oral History*. 2nd edn. Oxford, UK: Oxford University Press

Thompson, S. K. (2012) *Sampling*. 3rd edn. Hoboken USA: Wiley

Tierney, J. (2001) *Going (Down) by the Book*. http://www.nytimes.com/2005/09/17/opinion/17tierney.html?_r=0&pagewanted=print edn. New York, US: New York Times

Tierney, K., Bevc, C., and Kuligowski, E. (2006) 'Metaphors Matter: Disaster Myths, Media Frames, and their Consequences in Hurricane Katrina'. in *Shelter from the Storm: Repairing the National Emergency Management System After Hurricane Katrina*. ed. by Waugh, W. L. Los Angeles: Sage, 57-81

Tierney, K. and Trainor, J. (2004) *Networks and Resilience in the World Trade Center Disaster*. Multidisciplinary Center for Earthquake Engineering Research, Buffalo, NY: Research Progress and Accomplishments

Tierney, K. J. (2007) 'From the Margins to the Mainstream? Disaster Research at a Crossroads'. *Annual Review of Sociology* 33, 503-525

Tierney, K. J. (2001) *Facing the Unexpected : Disaster Preparedness and Response in the United States*. Washington, D.C.: Joseph Henry Press

Tierney, K. J. (1998) *The Field Turns Fifty: Social Change and the Practice of Disaster Field Work - Preliminary Paper # 273*. Preliminary paper #273 edn. University of Delaware: Disaster Research Center

Tierney, K. J. and Goltz, J. D. (1997) *Emergency Response: Lessons Learned from the Kobe Earthquake*. Preliminary paper #260 edn. University of Delaware: Disaster Research Center

Tierney, K. J. (1994) *Social Impacts and Emergency Response - Article #279 Northridge Earthquake January 17th 1994 - Preliminary Reconnaissance Report*. University of Delaware: Disaster Research Center

Tinkler, J. (2011) *Maximising the Impact of Your Research: A Handbook for Social Scientists*. London, UK: London School of Economics Public Policy Group

Tomlinson, B. (1986) 'Cooking, Mining, Gardening, Hunting: Metaphorical Stories Writers Tell about their Composing Processes'. *Metaphor and Symbolic Activity* 1 (1), 57-79

Trainor, J. E. and Velotti, L. (2013) 'Leadership in Disasters and Catastrophes'. *Journal of Leadership Studies* 7 (3), 38-40

Trainor, J. E. (2004) *Searching for a System: Multi-Organizational Coordination in the September 11th World Trade Center Search and Rescue Response*. [online] Masters thesis or dissertation. Disaster Research Center: University of Delaware

Trochim, W. M. K. (2006a) *Deduction & Induction* [online] available from <http://www.socialresearchmethods.net/kb/dedind.php> [February 24th 2014]

Trochim, W. M. K. (2006b) *Analysis* [online] available from <http://www.socialresearchmethods.net/kb/analysis.php> [February 24th 2014]

Turilli, L. (2012) *Dark Fate of Atlantis.* ed. by Luca Turilli's Rhapsody Trieste, Italy: Nuclear Blast

Turner III, D. W. (2010) 'Qualitative Interview Design: A Practical Guide for Novice Investigators'. *The Qualitative Report* 15 (3), 754-760

Turner, B. A. (1978) *Man-made Disasters*. London, UK: Wykeham Publications

Twigg, J. (2004) *Good Practice Review: Disaster Risk Reduction: Mitigation and Prepardeness in Development and Emergency Programming* [online] available from <file:///C:/Users/ab3426/Downloads/part1.pdf> [3rd, February 2015 2015]

U.K. Research Integrity Office (2014) *Research Design* [online] available from <http://www.ukrio.org/publications/code-of-practice-for-research/3-0-standards-for-organisations-and-researchers/3-4-research-design/> [April 30th 2014]

U.S. Government (2003) *Homeland Security Presidential Directive (HSPD) - 5, Management of Domestic Incidents* [online] available from <http://www.fas.org/irp/offdocs/nspd/hspd-5.html> [October 5th 2011]

Ultra Electronics (2015) *Command and Control Systems Atlas Software* [online] available from <http://www.ultra-ccs.com/details/36> [March 19th 2015]

United Human Rights Council (2014) *Genocide in Rwanda* [online] available from <http://www.unitedhumanrights.org/genocide/genocide_in_rwanda.htm> [October 28th 2014]

United Nations (2015) *Millennium Development Goals and Beyond 2015* [online] available from <http://www.un.org/millenniumgoals/> [February 9th 2015]

United Nations (2014) *United Nations International Strategy for Disaster Reduction - United Kingdom* [online] available from <http://www.unisdr.org/partners/countries/gbr> [November 3rd 2014]

United Nations (2007) *Terminology - International Strategy for Disaster Reduction (UNISDR)* [online] available from <http://www.unisdr.org/we/inform/terminology#letter-d> [September 20th 2014]

United Nations Office for Disaster Risk Reduction (2015) *Hyogo Framework for Action* [online] available from <http://www.unisdr.org/we/coordinate/hfa> [February 9th 2015]

United States Geological Survey (N.D.) *Mount St Helens: 1980 Cataclysmic Eruption* [online] available from <http://volcanoes.usgs.gov/volcanoes/st_helens/st_helens_geo_hist_99.html> [November 30th 2014]

United States Geological Survey (2014a) *The Modified Mercali Intensity Scale* [online] available from <http://earthquake.usgs.gov/learn/topics/mercalli.php> [October 8th 2014]

United States Geological Survey (2014b) *Measuring the Size of an Earthquake* [online] available from <http://earthquake.usgs.gov/learn/topics/measure.php> [October 8th 2014]

United States Geological Survey (2014c) *Landslide in Washington State - USGS is Working with Partners to Provide Up to Date Information* [online] available from <http://www.usgs.gov/blogs/features/usgs_top_story/landslide-in-washington-state/> [30th November 2014]

United States Geological Survey (2011) *Magnitude 9.0 - Near the East Coast of Honshu, Japan 2011 March 11 05:46:23 UTC* [online] available from <http://www.webcitation.org/mainframe.php> [September 29th 2014]

University of Delaware (2014a) *The Enrico Quarantelli Resource Collection* [online] available from <http://www.udel.edu/DRC/> [September 11th 2014]

University of Delaware (2014b) *The Disaster Research Center: Celebrating 50 Years of Disaster Research and Education* [online] available from <http://www.udel.edu/DRC/> [October 22nd 2014]

University of Idaho (N.D.) *Ontology & Epistemology* [online] available from <http://www.webpages.uidaho.edu/engl257/Classical/ontology_and_epistemology.htm> [June 9th 2014]

University of South Wales (2014) *Code of Practice for Research Students* [online] available from <http://research.southwales.ac.uk/media/files/documents/2014-10-09/2014_CoP_for_research_student.pdf> [August 26th 2015]

University of South Wales (2011) *Dealing with Disasters International Conference 2011* [online] available from <http://research.southwales.ac.uk/news/en/2011/aug/17/dealing-disasters-international-conference-2011/> [30th December 2015]

University of Southern California (2015) *Organizing Your Social Sciences Research Paper: Limitations of the Study* [online] available from <http://libguides.usc.edu/writingguide/limitations> [4th January 2016]

University of Strathclyde (N.D.) *Structured Interviews* [online] available from <http://www.strath.ac.uk/aer/materials/3datacollection/unit1/structuredinterviews/> [July 30th 2014]

University of Surrey (N.D.) *The Ten Steps of Content Analysis* [online] available from <http://libweb.surrey.ac.uk/library/skills/Introduction%20to%20Research%20and%20Managing%20Information%20Leicester/page_74.htm> [July 2015 2015]

University of Twente (2015) *Gatekeeping* [online] available from <http://www.utwente.nl/cw/theorieenoverzicht/Theory%20Clusters/Media,%20Culture%20and%20Society/gatekeeping/> [May 29th 2015]

University of Twente (2010) *Social Identity Theory* [online] available from <http://www.utwente.nl/cw/theorieenoverzicht/Theory%20Clusters/Interpersonal%20Communication%20and%20Relations/Social_Identity_Theory/> [April 6th 2015]

Unyimadu, S. O. (1989) 'Management and Industrial Revolution in Europe, United States of America and Japan'*. Engineering Management International* 5 (3), 209-218

US Bill of Rights (1791) *United States Constitution - Bill of Rights - Amendments 3-12* [online] available from <http://www.archives.gov/exhibits/charters/bill_of_rights_transcript.html> [December 17th 2014]

US Department of the Interior (2014) *Tribal Governments* [online] available from <http://www.doi.gov/governments/tribalgovernments.cfm> [December 17th 2014]

US Department of Transportation (2015) *Emergency Medical Services* [online] available from <http://www.transportation.gov/careers/veterans/emergency-medical-services> [July 21st 2015]

US Military Academy (2004) *The United States Military Academy Officer's Professional Reading Guide* [online] available from <http://www.dean.usma.edu/history/OPRG%20Top%20100%202011.doc> [September 16th 2011]

US Navy (1995) *Naval Doctrine Publication 6 - Naval Command and Control*. Washington D.C.: Office of the Chief of Naval Operations

Utley, R. (2012) *9/11 Ten Years After Perspectives and Problems*. Farnham: Ashgate Publishing Ltd

Valcik, N. A. and Tracy, P. E. (2013) *Case Studies in Disaster Response and Emergency Management*. Oxford, UK: CRC Press

Van de Ven, A. (2007) *Engaged Scholarship A Guide for Organizational and Social Research*. Oxford: Oxford University Press

van Mulken, M., le Pair, R., and Forceville, C. (2010) 'The Impact of Perceived Complexity, Deviation and Comprehension on the Appreciation of Visual Metaphor in Advertising Across Three European Countries'. *Journal of Pragmatics* 42 (12), 3418-3430

van Teijlingen, E. R. and Hundley, V. (2001) *The Importance of Pilot Studies - Social Research Update Issue 35* [online] available from <http://sru.soc.surrey.ac.uk/SRU35.html> [August 28th 2014]

Varsadi, J. A. (1989) *Myth Information: More than 590 Popular Misconceptions, Fallacies, and Misbeliefs Explained*. New York: Ballantine Books

Vasilescu, L., Khan, A., and Khan, H. (2008) 'Disaster Management Cycle - A Theoretical Approach'. *Management and Marketing* (1), 43-50

Vector Command (2015) *Command Support System* [online] available from <http://www.vectorcommand.com/command-support-system/> [March 19th 2015]

Virginia Department of Emergency Management (2012) *What we do* [online] available from <http://www.vaemergency.gov/aboutus/what-we-do> [January 2nd 2015]

Voght, W. P., Gardner, D. C., and Haeffelle, L. M. (2012) *When to use what Research Design*. New York USA: Guildford Press

Wachtendorf, T., Brown, B., and Holguin-Veras, J. (2013) 'Catastrophe Characteristics and their Impact on Critical Supply Chains: Problematizing Materiel Convergence and Management Following Hurricane Katrina'. *Journal of Homeland Security and Emergency Management* 10 (2), 497-520

Wadsworth, Y. (2011) *Do it Yourself Social Research* [online] 3rd edn. Walnut Creek, CA, USA: Left Coast Press. available from <http://site.ebrary.com/lib/coventry/docDetail.action?docID=10500137&ppg=67> [20th August 2014]

Wakefield, A. and Fleming, J. (2009) *The SAGE Dictionary of Policing*. London, UK: SAGE Publications

Wales Resilience (N.D.) *Wales Resilience Forum* [online] available from <http://walesresilience.gov.uk/behindthescenes/walesresilience/walesresilienceforum/?lang=en> [November 6th 2014]

Walker, J. S. (2004) *Three Mile Island : A Nuclear Crisis in Historical Perspective*. Berkeley, California US: University of California Press

Walliman, N. (2006) *Social Research Methods*. 1st edn. London: Sage Publications

Walsh, M. and Wigens, L. (2003) *Introduction to Research*. 1st edn. Cheltenham: Nelson Thomes Ltd

Warfield, C. (2008) *The Disaster Management Cycle - Global Development Research Center* [online] available from <http://www.gdrc.org/uem/disasters/1-dm_cycle.html> [22nd January 2015]

Wasserman, S. and Faust, K. (1994) *Social Network Analysis: Methods and Applications (Structural Analysis in the Social Sciences)*. Cambridge, UK: Cambridge University Press

Waterman, A. S. (1988) 'Identity Status Theory and Erikson's Theory: Communalities and Differences'. *Developmental Review* 8, 185-208

Waugh, W. (2009a) 'Katrina and the Governors'. *Public Organization Review* 9 (4), 343-351

Waugh, W. L. (2009b) 'Where was the "FEMA Guy" ... in Washington, in New Orleans, Retired...?'. *Administration & Society* 41 (6), 748-751

Waugh, W. L. (2009c) 'Mechanisms for Collaboration in Emergency Management: ICS, NIMS and the Problems with Command and Control'. in *The Collaborative Public Manager: New Ideas for the Twenty First Century*. ed. by O'Leary, R. and Blomgren-Bingham, L. Washington D.C. US: Georgetown University Press, 157-175

Waugh, W. L. (2007) 'EMAC, Katrina, and the Governors of Louisiana and Mississippi'. *Public Administration Review* 67, 107-113

Waugh, W. L. (ed.) (2006) *Shelter from the Storm: Repairing the National Emergency Management System After Hurricane Katrina.* Thousand Oaks CA: American Academy of Political and Social Science

Waugh, W. L. and Streib, G. (2006) 'Collaboration and Leadership for Effective Emergency Management'. *Public Administration Review* 6 (Special Issue - Dec), 131-140

Waugh, W. L. (1994) 'Regionalizing Emergency Management: Counties as State and Local Government'. *Public Administration Review* 54 (3), 253-258

Weather Channel (2014) *Super Typhoon Vongfong, Worlds Strongest Cyclone of 2014; Dangerous Threat to Okinawa, Japan this Weekend* [online] available from <http://www.weather.com/news/weather-hurricanes/typhoon-vongfong-japan-threat-20141006> [October 8th 2014]

Webb, G. (ed.) (2014) *Disaster Research Center 50th Anniversary*. 'Flexibility in Response to Disasters: Past Findings and Future Research Needs'. held 30th April - 3rd May 2014 at University of Delaware, Newark, US. Online: Disaster Research Center

Weber, R. (2004) 'The Rhetoric of Positivism Versus Interpretivism: A Personal View'. *Management Information Systems Quarterly* 28 (1), iii

Webster, J. and Watson, R. T. (2002) 'Analyzing the Past to Prepare for the Future: Writing a Literature Review'. *Management Information Systems Quarterly* 26 (2), xiii-xxiii

Webster, W. (2011) *Security Vetting and International Visitor Registration Documents (Email)* [type of communication] to McAleavy, T. [14th December 2011 2011]

Wellard, S. and McKenna, L. G. (2001) 'Turning Tapes into Text: Issues Surrounding the Transcription of Interviews'. *Contemporary Nurse* 11 (2-3), 180-186

Wenger, D., Quarantelli, E. L., and Dynes, R. R. (1990) 'Is the Incident Command System a Plan for all Seasons and Emergency Situations?'. *Hazard Monthly* 10 (March), 8-1

Wenger, D., Quarantelli, E. L., and Dynes, R. R. (1989) *Disaster Analysis: Police and Fire Departments - Final Report #1 on Phase II for Federal Emergency Management Agency*. University of Delaware: Disaster Research Center

Wengraf, T. (2001) *Qualitative Research Interviewing: Biographic Narrative and Semi-Structured Methods*. London: Sage Publications Ltd

Wessex 4X4 Response (2008) *Command and Control* [online] available from <https://www.wessex4x4response.org.uk/reports/2008/20080926.Exercise.Equinox/Command_and_control_explained.pdf> [31st March 2015]

West, B. and Smith, R. L. (2003) *The March Up: Taking Baghdad with the 1st Marine Division*. London: Pimlico

Westgate, K. and O'Keefe, P. (2008) *Some Definitions of Disaster*. http://www.ilankelman.org/miscellany/BDRU04.pdf edn. Disaster Research Institute: University of Bradford

Whetten, D. A. and Mackey, A. (2002) 'A Social Actor Conception of Organizational Identity and its Implications for the Study of Organizational Reputation'. *Business & Society* 41 (4), 393-414

White House (2014a) *Our Government* [online] available from <http://www.whitehouse.gov/our-government> [December 17th 2014]

White House (2014b) *State and Local Government* [online] available from <http://www.whitehouse.gov/our-government/state-and-local-government> [December 17th 2014]

White, G. F. (1974) *Natural Hazards : Local, National, Global*. London, UK: Oxford University Press

Wijkman, A. (1984) *Natural Disasters : Acts of God Or Acts of Man?*. London: London : International Institute for Environment and Development, for Earthscan

Wilde, S. (2005) *The Golden Thread* [online] available from <http://www.stuartwilde.com/2005/08/the-golden-thread/> [March 14th 2016]

Wiles, R., Crow, G., Charles, V., and Heath, S. (2011) *Informed Consent and the Research Process: Following Rule Or Striking Balances (Sociological Research Online)* [online] available from <http://www.socresonline.org.uk/12/2/wiles.html> [September 3rd 2014]

Wilken, R. (2013) 'An Exploratory Comparative Analysis of the use of Metaphors in Writing on the Internet and Mobile Phones'. *Social Semiotics* 23 (5), 632-647

Williams, M. (2000) 'Interpretivism and Generalisation'. *Sociology* 34 (2), 209-224

Willis, J. W. (2007) *Foundations of Qualitative Research: Interpretive and Critical Approaches*. 1st edn. London: SAGE Publications

Wilson, D. T., Hawe, G. I., Coates, G., and Crouch, G. (eds.) (2011) *2nd International Conference on Disaster Management*. 'A Decision-Support Framework for Large-Scale Emergency Response'. held 11th-13th May at Orlando, USA. Online: University of Central Florida

Wilson, E. K. (2013) *Lessons Learned the Hard Way: Incident Command System Learning and Training*. [online] Masters thesis or dissertation. Disaster Research Center: University of Delaware

Wilson, J. P. and Gosiewska, S. (2014) 'Multi-Agency Gold Incident Command Training for Civil Emergencies'. *Disaster Prevention and Management* 23 (5), 632-648

Winn, C., (2013) *I Never Knew that about New York*. Croydon, London, UK: Ebury Publishing

Wise, C. R. and Nader, R. (2002) 'Organizing the Federal System for Homeland Security: Problems, Issues, and Dilemmas'. *Public Administration Review* 62 (4), 44-57

Wittink, J. (ed.) (2011) *Conference for Organisational Knowledge, Learning and Capabilities*. 'Reliable Metaphor Analysis in Organizational Research: Towards a Dual, Dynamic Approach'. held 12-14th April: Academica.edu

Woolner, D. (2011) *The "Special Relationship" between Great Britain and the United States Began with FDR - Roosevelt Institute* [online] available from <http://www.rooseveltinstitute.org/new-roosevelt/special-relationship-between-great-britain-and-united-states-began-fdr> [May 26th 2015]

World Conference on Disaster Management (2013) *World Conference on Disaster Management* [online] available from <http://www.wcdm.org> [July 28th 2014]

World Health Organisation (2014) *Humanitarian Health Action - Definitions: Emergencies* [online] available from <http://www.who.int/hac/about/definitions/en/> [September 20th 2014]

World Rugby (2015) *Laws of the Game - Rugby Union* [online] available from <http://laws.worldrugby.org/?law=20&language=EN> [10th November 2015]

Worschel, S. and Austin, W. G. (1986) 'The Social-Theory of Inter-Group Behaviour'. in *Psychology of Intergroup Relations*. ed. by AnonChicago, Illinois, US: Nelson-Hall

Wrede, P. (2013) *Disaster Relief in America: A Brief History of FEMA - University of Colorado Boulder* [online] available from <http://libpress.colorado.edu/?p=2497> [November 30th 2014]

Wren, D. A., Bedeian, A. G., and Breeze, J. D. (2002) 'The Foundations of Henri Fayol's Administrative Theory'. *Management Decision* 40 (9), 906-918

Wright, B. and Cooper, R. C. (2004) *Stargate Atlantis*. Canada: MGM Television

Wright, S. (2007) *Why do some Disasters Kill More People than Others* [online] available from <Some Disasters are Bigger than Others?> [October 8th 2014]

Xiaoming, C. and Junchen, H. (2012) 'A Literature Review on Organization Culture and Corporate Performance'. *International Journal of Business Administration* 3 (2), 28-37

Yadav, A. (2009) *The Great Plague of 1665*. Fairfax, Virginia: George Mason University

Yates, J. (1999) 'Improving the Management of Emergencies: Enhancing the ICS'. *Australian Journal of Emergency Management* 14 (2), 18-24

Yelegaonkar, S. (2014) 'Principal Agent Theory'. *Indian Streams Research Journal* 4 (11), 1-6

Younce, E. (2011) 'Walker, Sally M.: Blizzard of Glass: The Halifax Explosion of 1917'. *School Library Journal* 57 (10), 163

Zardari, N. H., Kamal, A., Shirazi, S. M., and Yusop, Z. B. (2015) *Weighting Methods and their Effects on Multi-Criteria Decision Making Model Outcomes in Water Resources Management*. New York, US: Springer

Zhirov, N. (2001) *Atlantis - Atlantology: Basic Problems*. Honolulu, Hawaii: University Press of the Pacific

Zibulewsky, J. (2001) 'Defining Disaster: The Emergency Department Perspective'. *Baylor University Medical Center Proceedings* 14 (2), 144-149

7.2 Appendix 1: Emergency Support Functions (ESF)

Table of Emergency Support Functions (ESF)	
ESF	**Scope**
1. Transportation	Aviation/airspace management and control Transportation safety Restoration/recovery of transportation infrastructure Movement restrictions Damage and impact assessment
2. Communications	Coordination with telecommunications and information technology industries Restoration and repair of telecommunications infrastructure Protection, restoration, and sustainment of national cyber and information technology resources Oversight of communications within the Federal incident management and response structures
3. Public Works and Engineering	Infrastructure protection and emergency repair Infrastructure restoration Engineering services and construction management Emergency contracting support for life-saving and life-sustaining services
4. Firefighting	Coordination of Federal firefighting activities Support to wildland, rural, and urban firefighting operations January 2008 ESF Annexes Introduction ESF-i ESF-ii ESF Annexes Introduction January 2008 ESF Scope
5. Emergency Management	Coordination of incident management and response efforts Issuance of mission assignments Resource and human capital Incident action planning Financial management
6. Mass Care, Emergency Assistance, Housing, and Human Services	Mass care Emergency assistance Disaster housing Human services
7. Logistics Management and Resource Support	Comprehensive, national incident logistics planning, management, and sustainment capability Resource support (facility space, office equipment and supplies, contracting services, etc.)
8. Public Health and Medical Services	Public health Medical Mental health services Mass fatality management
9. Search and Rescue	Life-saving assistance Search and rescue operations
10. Oil and Hazardous Materials Response	Oil and hazardous materials (chemical, biological, radiological, etc.) response Environmental short- and long-term clean-up
11. Agriculture and Natural Resources	Nutrition assistance Animal and plant disease and pest response Food safety and security Natural and cultural

	resources and historic properties protection and restoration Safety and well-being of household pets
12. Energy	Energy infrastructure assessment, repair, and restoration Energy industry utilities coordination Energy forecast
13. Public Safety and Security	Facility and resource security, Security planning and technical resource assistance Public safety and security support, Support to access, traffic, and crowd control
14. Long-Term Community Recovery	Social and economic community impact assessment Long-term community recovery assistance to States, local governments, and the private sector Analysis and review of mitigation program implementation
15. External Affairs	Emergency public information and protective action guidance Media and community relations Congressional and international affairs Tribal and insular affairs
Source: (Federal Emergency Management Agency 2008e)	

7.3 Appendix 2: Quarantelli's Letter to O'Leary (2002)

99.08.24

Dear Dr. Oleary:

Here is a statement about the Incident Command System

The Questionable Nature of the Incident Command System

The Incident Command System (ICS) is widely used by different organizations attempting to manage disasters and other crises. The essence of the system is made explicit in the writings of proponents of ICS. Thus, in Biot # 9 an advocate of the model said "The ICS requires someone to be in charge from the 'word go'...The organizational structure of the ICS develops top down...The Incident Commander at the Command Post must establish command..."(Gasparic)

Another advocate of this model has written "in all events, there can only be one boss, one 'shot caller,' directing the focus of the group, and setting the group's goals...[it is a] system of 'who's in command'"(Kane). In essence the ICS is a top down, centralized system with emphasis on command and control.

However, most disaster researchers who have systematically studied disaster management for more than 40 years, think that this is a poor model for managing at times of crises. They find it unrealistic to think that anyone at the height of a crisis could be "in charge" given the lack of information, conflicting and incorrect rumors, and the diversity of the many groups involved in such situations. On the basis of their research they think that what is sometimes called an emergent resource model, should be used.

Coordination rather control is what is needed. A degree of decentralization of decision making is necessary, not an unrealistic attempt to centralize everything, especially from the top down. Recent attempts by advocates of ICS to rename the ICS as an Incident Management System when it goes beyond simply replacing one word for another is perhaps a belated recognition that "command and control" is simply not possible in crises.

Recent calls by advocates for ICS that there is a need to go beyond anecdotal accounts, may also be an implicit recognition that there simply is no solid research data that can be cited in support of the supposed efficiency and effectiveness of the ICS model for crisis management. At the very least, anyone involved in disaster planning and crisis managing should recognize that there is a solid body of data (some of a quantitative nature) that challenges the supposed merit of an ICS model. As history has often shown, just because something is widely believed and even actualized at times, is no proof at all of the validity of the belief.

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Source: (Quarantelli 2002)

7.4 Appendix 3: Question Schedule

Interview Number / Date:	**Interviewer: Tony McAleavy**
Name of participant:	**Location of Interview:**
Organisation:	**Rank, Role or Title:**
Interview Policy Review	
• ***Interview Consent Form*** • ***Interview Briefing Note*** • ***Interview Data Capture Policy*** • ***Data Protection Assurance*** • ***Right of Withdrawal Policy***	
Interview questions:	
Q1: Please describe your command and control experience?	
Q2: What is command and control?	
Q3: Describe the U.K. / U.S. command and control framework?	
Q4: From your experience can you describe an example of when command and control worked well? What happened and why?	
Q5: From your experience can you describe an example of when command and control did not work? What happened and why?	

Q6: What are the key policies and documentation underpinning U.K. / U.S. command and control?
Q7: What is your organisation's view on command and control?
Q8: What is the purpose of command and control?
Q9: Where did command and control originate from?
Q10: Please draw a visual representation of command and control (see attached sheet)
Q11: What do you see as the key elements of U.K. / U.S. command and control?
Q12: Is command and control a useful emergency management tool?
Q13: What factors contribute to effective command and control?
Q14: Please give me five words to describe command and control?
Q15: In your opinion what works well within the U.K. / U.S. command and control framework?
Q16: In your opinion what does not work within the U.K. / U.S. command and control framework?
Q17: Can the existing U.K. / U.S. command and control framework be improved?

Q18: Please read the following eight statements and indicate which of these most accurately reflects your view of command and control? (if more than one are relevant please mark them in order of relevance i.e. 1 most relevant etc)

Command & Control is a(n):

1. ***MACHINE:*** *Efficiency, waste, maintenance, order, clockwork, cogs in a wheel, programmes, inputs and outputs, standardisation, production, measurement and control, design* ☐
2. ***ORGANISM:*** *Living systems, environmental conditions, adaptation, life cycles, recycling, needs, homeostasis, evolution, survival of the fittest, health, illness* ☐
3. ***BRAIN:*** *Learning, parallel information processing, distributed control, mind-sets, intelligence, feedback, requisite variety, knowledge, networks* ☐
4. ***CULTURE:*** *Society, values, beliefs, laws, ideology, rituals, diversity, traditions, history, service, shared vision and mission, understanding, qualities, families* ☐
5. ***POLITICAL SYSTEM: I****nterests and rights, power, hidden agendas and back room deals, authority, alliances, party-line, censorship, gatekeepers, leaders, conflict management* ☐
6. ***PSYCHIC PRISON:*** *Conscious & unconscious processes, repression & regression, ego, denial, projection, coping & defence mechanisms, pain & pleasure principle, dysfunction, workaholis* ☐
7. ***FLUX & TRANSFORMATION:*** *Constant change, dynamic equilibrium, flow, self-organisation, systemic wisdom, attractors, chaos, complexity, butterfly effect, emergent properties, dialectics, paradox* ☐
8. ***INSTRUMENT OF DOMINATION:*** *Alienation, repression, imposing values, compliance, charisma, maintenance of power, force, exploitation, divide and rule, discrimination, corporate interest* ☐

9. ***NONE OF THE ABOVE*** ☐
Is there anything else you would like to add?
Interview Review
• ***Interview Recap*** • ***Data Analysis Process Overview*** • ***Research Outcomes Discussion*** • ***Thank You & Close***

Participant Name:	**Interviewer Name:** **Signature:** **Date:**

Command & Control Visualisation Recording Sheet

Interview Number / Date:	**Name of Participant:**
Organisation:	**Signature:**

Please draw a visual representation of command and control

7.5 Appendix 4: Participant's Welcome Pack

Tony McAleavy
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"METAPHORS OF COMMAND AND CONTROL IN THE UNITED KINGDOM AND UNITED STATES OF AMERICA"
PHD RESEARCH PROJECT

Dear Participant,

Firstly, may I take the opportunity to thank you for agreeing to participate in this research project. Your input is greatly valued as you will undoubtedly provide a keen insight into the world of emergency management and a vital source of rich data on which to base my PhD thesis. This welcome pack is designed to provide you with a general overview of the researcher, the project and the interview process.

The Researcher: I am currently an academic at Coventry University's (www.coventry.ac.uk) Centre for Disaster Management. I am also a former emergency management practitioner with over ten years of experience. I have worked for the Ambulance Service, H.M. Coastguard and as a volunteer with the British Red Cross. Additionally, I managed the Civil Contingencies Unit at Durham County Council prior to transiting into full-time academia in July 2012. As such, I have a strong professional and personal interest in emergency management.

Research Purpose: this project forms the field research component of my PhD Disaster Management research programme. I am currently enrolled at the University of Glamorgan Business School (www.glam.ac.uk), under the supervision of Dr. Martin Rhisiart (mrhisiar@glam.ac.uk) and Professor Brian Hobbs (bhobbs@glam.ac.uk). Please note: a copy of the final thesis and / or a Synopsis Report will be made readily available to all participants at their request.

Project Overview: this project is focused on the command and control models presently being used by practitioners to respond to emergencies in both the United Kingdom and the United States of America. I am seeking to develop a

greater understanding of how key-emergency responders view the models, namely the British Gold, Silver & Bronze / CONOPS and the American Incident Command System (ICS) / National Incident Management System (NIMS) frameworks. Consequently, I am keen to learn about your views and experiences, both positive and negative, of responding to emergencies in your respective command and control environment.

Participants: Ambulance Service / Emergency Medical Services personnel, Fire Fighters, Police / Law Enforcement, and Local, Regional / State and National / Federal Government representatives are currently actively supporting this project. Three participants from each agency have been engaged for interview purposes.

Research Programme: a schedule of 32 field interviews has been arranged and split into three phases. Firstly, a *"Pilot"* phase consisting of two interviews with leading U.K. emergency management academics will take place to validate the field-interview method and processes. This will be followed by *"Live Phase One"* which will consist of 15 U.K. based field interviews, scheduled between September – February 2013. Finally, *"Live Phase Two"* consisting of 15 U.S. based field interviews, scheduled between February – June 2013 will be completed. The collated data will then be subjected to rigorous analysis; which will involve intra and inter agency comparisons in U.K., U.S. and transnational contexts. The analysed data will then be used to inform the development of my PhD thesis and may potentially be used in other research publications.

Administration: this research project adheres to the ethics policies listed below and all research activities will be conducted within their parameters: please see the accompanying Briefing Note for further details.

- Interview Data Capture Policy
- Data Protection Assurance Policy
- Right of Withdrawal Policy

At the beginning of the interview you will be asked to sign a Consent Form and will have the opportunity to ask any questions you may have. Alternatively, if you have any queries prior to the interview please do not hesitate to get in touch.

May I offer my sincerest thanks and gratitude for your participation. Your support is greatly appreciated and I look forward to your interview.

Yours sincerely,

Tony McAleavy

INTERVIEW BRIEFING NOTE

- ***PROJECT TITLE:***

"Metaphors of Command and Control IN THE United Kingdom and the United States of America "

- ***INTERVIEW PURPOSE:***

The purpose of the interview is to gather data on participant's views and experiences of command and control

- ***SCOPE OF THE PROJECT***

This project is a multi-national comparative study, involving emergency management practitioners from the United Kingdom and the United States of America. Collated data will be analysed intra and inter agency & country to produce the study's research outcomes. This data will be used to inform the development of a PhD Thesis and other research-informed publications that may include Conference and Journal Papers etc in order to progress our understanding of Command and Control.

- ***DATA CAPTURE:***

  Methods: handwritten notes, electronic voice recording and auto / manual transcription

- ***DATA PROTECTION:***

  a) ***Electronic Recordings:*** *will be stored on a secure password encrypted server (Interviewer access only)*
  b) ***Transcripts & Hand-Written Notes:*** *will be stored in a filing cabinet in a key-card protected office at Coventry University (Interviewer & Supervisory Team access only)*
  a) ***Processed Data:*** *analysed data that is not attributable to individuals or specific organisations will form part of the final thesis and may also be published in various forms at a later date*

- ***POLICY STATEMENT:***

  The interviewer assures that the data gathered during the research process will be handled in accordance with the Data Protection Policy below and will be used for the stated research purposes only.

RIGHT TO WITHDRAW:

The interviewer assures that:

a) *The interviewee can withdraw consent at any time and by any means of recognised communication (i.e. phone, email or text etc)*
b) *No reasons for withdrawal will be sought*
c) *All collated data will be destroyed or returned to the interviewee*

Tony McAleavy

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7.6 Appendix 5: Informed Consent Form

INTERVIEW CONSENT FORM

- ***PROJECT TITLE:***

"Metaphors of Command and Control in the United Kingdom and the United States of America

- ***STATEMENT:***

The undersigned hereby consent to participate in an interview for the express purpose of contributing to the PhD field research programme of the interviewer listed below. This statement confirms that the interview will adopt an ethically appropriate manner that will do no harm to the participant, the respective organisations, society or the interviewer and will conform to the policies listed below:

a) ***Interview Data Capture Policy***
b) ***Data Protection Assurance***
c) ***Right to Withdraw Policy***

- ***INTERVIEWER:***

a) ***Name:*** *Tony McAleavy*
b) ***University:*** *University of South Wales*
c) ***Programme:*** *PhD Disaster Management*
d) ***Student Number:*** *08210012*

- ***SIGNATURE:***

- ***DATE:***

- ***INTERVIEWEE:***

a) ***Name:***
b) ***Organisation:***

- ***SIGNATURE:***

- ***DATE:***

7.7 Appendix 6: Linguistic Metaphor Quotes – United Kingdom

Agency	ID	Quotation	Metaphor	Source	Country
CG	**CG1**	It's amazing the amount of experience there is **out** there	The Mind is a Container for Objects	Master List	UK
CG	**CG1**	I'm not entirely clear on what a critical incident is and what the difference is between critical incident major incident erm disruptive challenge whatever erm but I think I can **bow** to my colleagues within the emergency services where they will call something as a major incident or a critical incident	Physical Movement	Master List	UK
CG	**CG1**	If I work from the **top down** (laughing) which maybe isn't the way a lot of others see it obviously we have COBR Cabinet Office Briefing Room	Status is Position	Master List	UK
CG	**CG1**	It can be **fluid** erm and then sitting underneath the SCG structure you've got your silver and your bronzes	A Problem is a Body of Water	Master List	UK
CG	**CG1**	In terms of the current administration is that actually there's a lot more of the **bottom u**p that influences COBR meeting as opposed to the **top down** that isn't in previous administrations there's been a real love affair with the COBR brand	Status is Position	Master List	UK
CG	**CG1**	In terms of the current administration is that actually there's a lot more of the bottom up that influences COBR meeting as opposed to the top down that isn't in previous administrations there's been a real **love affair** with the COBR brand	Beliefs are Lovers	Master List	UK
CG	**CG1**	When everything and anything happens even if it's something that we wouldn't class as a significant incident at a local level if it **hit** the media in previous administrations that would mean that COBR was up and running	Effects of Humour are Injuries	Master List	UK
CG	**CG1**	When everything and anything happens even if it's something that we wouldn't class as a significant incident at a local level if it hit the media in previous administrations that would mean that COBR was **up and running**	Physical Movement	Master List	UK
CG	**CG1**	So anyway off we went we got there on on to the **bandwagon** of a structure of meetings the battle rhythm of meetings	Person and a Horse	Master List	UK
CG	**CG1**	We then **stood-up** the police then stood-up a multi-agency SCG	Physical Movement	Master List	UK
CG	**CG1**	Where you have people who pull the conversation **down** to the operational tactical stuff which is really frustrating	Status is Position	Master List	UK

CG	**CG1**	At the moment we are just focusing on RED Resilience you know ourselves Resilience and Emergencies Division and **building up** our knowledge and understanding and skills	Ideas are Constructed from Objects	Master List	UK
CG	**CG1**	You get a medium sized incident you got your bronze staff your responders on the **ground**	Status is Position	Master List	UK
CG	**CG1**	I still think a lot of them are very effective silver commanders but they don't give them the feedback that moves them **up** to that strategic gold level	Status is Position	Master List	UK
CG	**CG2**	So right at the very **top** you've got COBR	Status is Position	Master List	UK
CG	**CG2**	At local you have got the Strategic Coordinating Group that's set up by erm that's headed up by usually the Assistant Chief or Chief that's really crucial that's what I **feed** into national as a Resilience Advisor*	Acting on is Feeding	Master List	UK
CG	**CG2**	The National Risk Register **falls out** of that the National Resilience Planning Assumptions	Premises are the Sources of Solutions	Master List	UK
CG	**CG2**	We haven't got there yet is the insurance side of it that's side of it how we fully engage with it but it's definitely **heading in the right direction**	Physical Movement	Master List	UK
CG	**CG2**	I think it's actually gone **back** into its shell I think because we've had austerity people have lost erm the use of erm the have lost their their erm their whole sphere of what can go into an LRF and you see less and less voluntary sector involvement	Physical Movement	Master List	UK
CG	**CG2**	The whole terminology and lexicon-ology of the terms in resilience community is bonkers absolutely just crazy stuff and erm I find it very difficult to sometimes to erm get a **grasp** on what people talk about in meetings and I have to constantly ask them so I think that remains an issue	Physical Movement	Master List	UK
CG	**CG2**	I don't think that's particular what **falls out** of the good bits that makes the bad bits	Premises are the Sources of Solutions	Master List	UK
CG	**CG2**	What do people need to know at local level at national level why are we here are we to bring our expertise in certain so we can **feed** into the bigger picture so do we need to know everything	Acting on is Feeding	Master List	UK
CG	**CG2**	It was really easy as Head of Resilience to put the plans action into place so that was about bringing people together bringing Resilience Advisors together erm knowing what was going **on the ground***	Status is Position	Master List	UK

CG	**CG2**	When it **struck m**e that I was gonna be heading up the flooding in July erm the first thing I did was was actually did nothing I know it sounds bonkers	Emotions are Forces	Master List	UK
CG	**CG2**	Just understand the situation is understand what you've got to do and then just step back ten minutes isn't gonna make a difference certainly at my level erm you know the actions already starting to happen at local level and if you just **step back** it's fantastic so it's letting people get on with what they should do	Progress is Forward Motion	Master List	UK
CG	**CG2**	The hardest thing to do when your gut is telling you to do something you know the emotional side **kicks in** you think there's something I've gotta be able to do something to actually say either there's nothing I can at this time without getting in the way and not adding value	Emotions are Forces	Master List	UK
CG	**CG3**	When you you say UK I interpret that to mean from the the **very top through to the bottom***	Status is Position	Master List	UK
CG	**CG3**	The PM (Prime Minister) to the PC (Police Constable) **the very very top to the very very bottom** of the span	Status is Position	Master List	UK
CG	**CG3**	I would take care to describe that pattern from the **ground up** some other the other services might define it from the **top down***	Status is Position	Master List	UK
CG	**CG3**	Some people are deeply **wedded** to it some people have a pragmatic attachment to it it's there it aint broke let's not fix it lets not mess with it	Beliefs are Lovers	Master List	UK
CG	**CG3**	That would then encapsulate the erm local response in terms of the sort of **higher level** coordination then the national arrangements that's set out in the concept of operations	Status is Position	Master List	UK
CG	**CG3**	They were a talking shop so people would come together an share information what this did in one fell swoop was move the information sharing **down** the food chain	Status is Position	Master List	UK
CG	**CG3**	We would dearly like to see proposals go **forward** how the collective the LRF can consider how we will in informational terms support the SCG	Progress is Forward Motion	Master List	UK
CG	**CG3**	Our civil protection doctrine as it pertains to Command and Control and Coordination has its **roots** in you know von Clausewitz the rules of war	Beliefs are Plants	Master List	UK
CG	**CG3**	It's equally important going **upwards** and **downwards** as across agencies	Status is Position	Master List	UK
CG	**CG3**	I've occasionally got certainly police and fire officers backs up by discussing that	Progress is Forward Motion	Master List	UK

CG	**CG3**	The ability of a commander to actually stand out from their own service and make the case for the importance of multi-agency picture back to their single service more junior personnel who may be **bridling** against it	Person and a Horse	Master List	UK
CG	**CG3**	We knew each other on first name terms we were more or less **inside each other's heads** so none of this sort of the hello I'm John what do you do stuff you know they were straight into it	Abilities are Entities inside a Person	Master List	UK
CG	**CG3**	But actually ensuring that the multi-agency the **bigger picture** was erm was achieved sustained and fed into*	Conducting Research is Solving a Puzzle	Master List	UK
CG	**CG3**	But actually ensuring that the multi-agency the bigger picture was erm was achieved sustained and **fed** into*	Acting on is Feeding	Master List	UK
CG	**CG3**	The interoperability very is is a long running **sore**	Harm is Physical Injury	Master List	UK
CG	**CG3**	You don't get a cultural shift in a two year programme you get a cultural shift in a five to ten year period and that requires service leadership political leadership **sat on top** of that and resourcing	Status is Position	Master List	UK
LG	**LG1**	Unless you're quite disciplined and you have got that regular discipline it's very easy to slip **in and out** of roles	Change is Motion	Master List	UK
LG	**LG1**	It's just one slice of the fuller picture (situational awareness)	Conducting Research is Solving a Puzzle	Master List	UK
LG	**LG1**	It worked so well is because we exercised it to death	Speed of Action is Speed of Motion	Master List	UK
LG	**LG1**	Took a lot of **fighting** to get (training)	Obstacles to Action are Obstacles to Motion	Master List	UK
LG	**LG1**	Something else just **popped** into my head, what works well, urm, yeh, the kind of training and exercising.	Ideas are Projectiles	Master List	UK
LG	**LG2**	Make decisions from the **ground** (Bronze commanders)	Status is Position	Master List	UK
LG	**LG2**	COBR for example if you had a situation where there was a fire in Durham and suddenly the instructions came from **on high** London for example	Status is Position	Master List	UK
LG	**LG2**	On the **ground** (frontline responders)	Status is Position	Master List	UK
LG	**LG3**	The sort of erm operational on the **ground** (frontline responders)	Status is Position	Master List	UK

LG	**LG3**	You wouldn't actually **round-up** people I think I'll have you five or six there's the guns over there so you know you've got people who are sort of really trained for specific things	Person and a Horse	Master List	UK
LG	**LG3**	The sort of the go ahead or the referral **upwards** if you like is quite clear (authorisation to act)	Status is Position	Master List	UK
LG	**LG3**	The strategic direction comes **down**	Status is Position	Master List	UK
LG	**LG3**	People get in and resolve things they don't just pass it **up the line** and wait for it for a response	Status is Position	Master List	UK
LG	**LG3**	It'd be a very stupid erm commander gold commander who didn't want to know what was happening **on the ground**	Status is Position	Master List	UK
LG	**LG3**	That we were **grappling** with (the incident)	Thinking is Manipulating an Object	Master List	UK
LG	**LG3**	Most of the time you end up **feeding** the beast literally getting the SITREP together rather than actually doing what you need to be doing a lot of the time so it's kind of juggling your priorities	Acting on is Feeding	Master List	UK
LG	**LG3**	I kind of ask him to **coral** them (partners) to call a gold for snow	Person and a Horse	Master List	UK
P	**P1**	You've got your chief execs so **below** me in the gold (Police Gold Commander referring the Gold Command)	Status is Position	Master List	UK
P	**P1**	But the **shots** are called by the national co-ordinator	Competition is War	Master List	UK
P	**P1**	There are radio difficulties but they were things we have **ironed** out	Easy Action is Easy Motion	Master List	UK
P	**P2**	Different **pieces of the puzzle** (multi-agency situational awareness)	Conducting Research is Solving a Puzzle	Master List	UK
P	**P2**	There is a little bit of a **rub** where people haven't shared information (friction)		Master List	UK
P	**P2**	People on the **ground***	Status is Position	Master List	UK
P	**P2**	The commander is privy to much more information and has a much **wider picture** than the bronze on the ground	Conducting Research is Solving a Puzzle	Master List	UK
P	**P2**	As the **picture** comes up (situational awareness)	Conducting Research is Solving a Puzzle	Master List	UK
P	**P2**	As the picture comes **up** (situational awareness)	Status is Position	Master List	UK
P	**P2**	It's all coming straight **in** to you (communications)	The Mind is a Container for Objects	Master List	UK

P	**P2**	**Closes the window** (removes a tactical option)	People/Bodies are Buildings	Master List	UK
P	**P2**	Nobody's actually **gripped** it at the scene (the incident)	Thinking is Manipulating an Object	Master List	UK
P	**P2**	If there isn't a sergeant there or an inspector there fairly quickly then it can it can **get away from you** and then once an incident is **ahead of you** then you're always trying to play **catching up** (the incident)	The Progress of an External Event is Forward Motion	Master List	UK
P	**P2**	There was a gold who really wanted to be silver and weren't going exactly how he wanted them I swear he was gonna walk out **into the playground** and be bronze as well	Status is Position	Master List	UK
P	**P2**	Pass instructions or directions **up and down** the chain	Status is Position	Master List	UK
P	**P2**	Being a bronze and then they **step up** to silver	Status is Position	Master List	UK
P	**P2**	They were getting **drawn down** just with their enthusiasm to help (mission creep)	Status is Position	Master List	UK
P	**P2**	You can **push** command and control down to a level	Being Assigned Obligation is Receiving Burden	Master List	UK
P	**P2**	You can push command and control **down** to a level	Status is Position	Master List	UK
P	**P3**	Human nature takes over erm some of the more rationale erm objective decision making tends to go **out the window**	People/Bodies are Buildings	Master List	UK
P	**P3**	On the **ground** (frontline responders)*	Status is Position	Master List	UK
P	**P3**	There are only so many things that you can **fit into one human head** (complexity of response operations)	The Mind is a Container for Objects	Master List	UK
P	**P3**	If you over resource and you make those spans of control too small then you increase the dangers of both things **falling through the gaps**	Conducting Research is Solving a Puzzle	Master List	UK
P	**P3**	They then creep their mission away from the strategic level into **filling a gap** that's appeared at tactical level (Gold Commanders)	Conducting Research is Solving a Puzzle	Master List	UK
P	**P3**	It means that it is effective when you really need to use it in anger (Silver command training)	Competition is War	Master List	UK
P	**P3**	How quickly the national decision model was getting **spun around** and we were making all these difficult decisions very quickly	Ideas are Objects	Master List	UK
P	**P3**	You put command and control **over it** and quite quickly the whole thing starts to simplify and you get a grip of it	Control is Up	Master List	UK

P	**P3**	You put command and control over it and quite quickly the whole thing starts to simplify and you get a **grip** of it	Thinking is Manipulating an Object	Master List	UK
F	**F1**	The individual organisation **fits in with the big picture**	Conducting Research is Solving a Puzzle	Master List	UK
F	**F1**	We might have almost have two **levels** of silver in play	Status is Position	Master List	UK
F	**F1**	We might have almost have two levels of silver in **play**	Games & Play	Master List	UK
F	**F1**	It will works (building relationships with multi-agency commanders) but it's more difficult to achieve the **lower** down the organisation*	Status is Position	Master List	UK
F	**F1**	It's fair to say that those relationships as you go **up** become more up the command levels between gold sorry bronze silver and then gold as you go **up** the personal the getting to know the individual commanders is possibly more important or more vital or beneficial	Status is Position	Master List	UK
F	**F1**	The Fire Services Act which outlines what we need to do this then comes **down** to a strategic document called the National Framework Document on top of that there are all of the operating procedures	Premises are the Sources of Solutions	Master List	UK
F	**F1**	So you could start with the Civil Contingencies Act you know all **flows that down int**o some strategic guidance through Emergency Preparedness again further down into some specific guidance	Premises are the Sources of Solutions	Master List	UK
F	**F1**	All taking the common learning from it and moving forward	Progress is Forward Motion	Master List	UK
F	**F1**	So there needs to be that learning loop in place as well so that the organisation are **moving forward** erm and that again feeds* all the way back through	Progress is Forward Motion	Master List	UK
F	**F1**	So there needs to be that learning loop in place as well so that the organisation are moving forward erm and that again **feeds*** all the way back through	Acting on is Feeding	Master List	UK
F	**F1**	The same information that was getting **pushed out** to various different sources	The Mind is a Container for Objects	Master List	UK
F	**F2**	The silver level is the conduit **up** and **down** and **sideways** and is probably the most misunderstood level	Status is Position	Master List	UK
F	**F2**	People coming **down**, people coming **up**, and this uncertainty about what's actually happening in silver	Status is Position	Master List	UK
F	**F2**	With silver sometimes there's the, can be a clear house and very effective or can be something that's **fighting battles** upwards and **fighting battles** downward	Competition is War	Master List	UK

F	**F2**	With silver sometimes there's the, can be a clear house and very effective or can be something that's fighting battles **upwards** and fighting battles **downward**	Status is Position	Master List	UK
F	**F2**	Off-site fire service silver command was stopping the flow of information **feeding** the beast upwards	Acting on is Feeding	Master List	UK
F	**F2**	Off-site fire service silver command was stopping the flow of information feeding the beast **upwards**	Status is Position	Master List	UK
F	**F2**	Spending more time actually **feeding** the beast upwards and just **feeding** information*	Acting on is Feeding	Master List	UK
F	**F2**	Spending more time actually feeding the beast **upwards** and just feeding information*	Status is Position	Master List	UK
F	**F2**	Whereas in the past, we might be **shackled** with those decisions, because the standard operating procedure says you can't do something	The Past is an Instrument of Constraint	Master List	UK
F	**F2**	You **put in** all the risk assessments you **put in** all the health and safety factors of I already mentioned the decision making model dynamic risk assessment's so it's making sure people are and I've mentioned it safe	Problem is a Constructed Object	Master List	UK
F	**F2**	People moving **up** to gold and **dipping back** to silver	Status is Position	Master List	UK
F	**F2**	People that will **step up to the mark** at silver	Progress is Forward Motion	Master List	UK
F	**F3**	Worked my way **up** to erm watch manager (height equals success)	Status is Position	Master List	UK
F	**F3**	Having the lack of information that erm we had in the **run up** to those conditions	Progress is Forward Motion	Master List	UK
F	**F3**	You often get the commanders maybe who if they're a strategic gold level or silver level focusing **down** and then then getting pulled **down**	Status is Position	Master List	UK
F	**F3**	These are things that are high profile that the higher the more senior managers need to be involved but then they get involved at the **lower level** than they should be lines (of command) are then blurred	Status is Position	Master List	UK
F	**F3**	The **lines are then blurred** as to you know as to what roles and responsibilities are	The Visual Field is a Container	Master List	UK
F	**F3**	Generally making sure the guys and girls **on the groun**d have got what they needed*	Status is Position	Master List	UK
F	**F3**	Whereas before we were sort maybe **pushed to one** side we're very much at the forefront having to you know prove you worth	Status is Position	Master List	UK

F	**F3**	Getting i**nto the weeds** of what each person should be doing	Status is Position	Master List	UK
F	**F3**	The frontline is this firefighters who go **out** there and fight the fire	Obstacles to Action are Obstacles to Motion	Master List	UK
F	**F3**	The frontline is this firefighters who go out there and **fight** the fire	Competition is War	Master List	UK
F	**F3**	They closed ranks (non-integration of emergent resources)	Competition is War	Master List	UK
F	**F3**	It gets even further **down** within the fire service (silo mentality)	Status is Position	Master List	UK
A	**F3**	They built them a home from home over there which it was sort of a **backwards step** really	Progress is Forward Motion	Master List	UK
A	**A1**	I was sat at gold I would expect a tactical plan to come **up** and for me go fine sign it date and send it back **down** saying initiate that plan	Status is Position	Master List	UK
A	**A1**	There are some individuals that are quite **high up** that constantly need to be spoon-feed*	Status is Position	Master List	UK
A	**A1**	There are some individuals that are quite high up that constantly need to be **spoon-feed***	Acting on is Feeding	Master List	UK
A	**A1**	You can't beat putting yourself **up there** and going out to incidents and putting it into practice (Experience is an external entity)	Knowledge as an External Commodity	Master List	UK
A	**A1**	Which is ignore what's going on on the **ground** and make sure the information is going back you know feed the bigger picture	Status is Position	Master List	UK
A	**A1**	Which is ignore what's going on on the ground and make sure the information is going back you know **feed** the bigger picture	Acting on is Feeding	Master List	UK
A	**A1**	Which is ignore what's going on on the ground and make sure the information is going back you know feed **the bigger picture**	Conducting Research is Solving a Puzzle	Master List	UK
A	**A1**	Academically on the test papers during the first two days they really struggle and some of them are quite vociferous in arguing with you and it's not **their world** you see (Doctor's doing command training)	Knowledge as an External Commodity	Master List	UK
A	**A1**	You are getting that recognition from the doctor fraternity **out there** ah these guys actually know what they're talking about because they do it every single day	The Mind is a Container for Objects	Master List	UK
A	**A1**	Now were **feeding** down to one body Emergency Preparedness which is in erm Leeds which all bounces into this NHS North cluster that's got a new command and control structure	Acting on is Feeding	Master List	UK

A	**A1**	Now were feeding **down** to one body Emergency Preparedness which is in erm Leeds which all bounces into this NHS North cluster that's got a new command and control structure	Status is Position	Master List	UK
A	**A1**	Erm I think the **thirst** to get it right for the Olympics	Desire is Hunger	Master List	UK
A	**A1**	So communicating with the bronze and obviously communicating **upwards** to gold*	Status is Position	Master List	UK
A	**A1**	Obviously when you you go into silver I **lost all sight** of the incident (situational awareness)	The Visual Field is a Container	Master List	UK
A	**A1**	The bronze structure linking that up and making it clear it happens on the **ground** in the incidents*	Status is Position	Master List	UK
A	**A1**	Emails is one of the ones that can **suck** people in	Control Over Action is Control Over Motion	Master List	UK
A	**A1**	So I can keep our bronze commander in the **picture**	Conducting Research is Solving a Puzzle	Master List	UK
A	**A2**	We're going in to erm **back** to the way we were	Progress is Forward Motion	Master List	UK
A	**A2**	We're passing a patient **through** the system efficiently	Progress is Forward Motion	Master List	UK
A	**A2**	From a BT (British Telecommunications) point of view on what their purpose is because that is standard across the country and that **feeds** into us	Acting on is Feeding	Master List	UK
A	**A2**	Giving the dispatcher a real **window** into what's actually going on	People/Bodies are Buildings	Master List	UK
A	**A3**	I've been bronze commander **on the ground** at multiple incidents*	Status is Position	Master List	UK
A	**A3**	Erm Command is having the authority to erm move resource and allocate resources and Control is acting **under** that authority so if you like command is erm is vertical control is horizontal	Status is Position	Master List	UK
A	**A3**	Sometimes a **higher** level for instances if COBR is getting involved	Status is Position	Master List	UK
A	**A3**	**Feeding** the beast at the top sometimes takes priority to actually responding on the ground*	Acting on is Feeding	Master List	UK
A	**A3**	Feeding the beast at the **top** sometimes takes priority to actually responding on the ground*	Status is Position	Master List	UK
A	**A3**	There's some very quick decisions being made on a very **fluid** situation	A Problem is a Body of Water	Master List	UK
A	**A3**	That's **fed** by the sort of lead government department erm structure	Acting on is Feeding	Master List	UK

A	**A3**	I think it was probably a lack of confidence in not wanting to sort of **lose sight** of anything (senior command oversight)	The Visual Field is a Container	Master List	UK
A	**A3**	It provides structure to response erm particularly in big bang incidents erm where people are operating **outside** of their normal day to day activity*	Knowledge as an External Commodity	Master List	UK
A	**A3**	Where police are leading and they arguably shouldn't be and they haven't gone as effectively fortunately there's never been any that I've experienced that have well and truly **fallen over** but there's been ones that have been fairly close	Control is Up	Master List	UK
A	**A3**	It was the same information it was all coming at the **top** and the **top** central government were getting the same information from four sources locally and across all LRFs must have been an absolute nightmare	Status is Position	Master List	UK

7.8 Appendix 7: Linguistic Metaphor Quotes – United States of America

Agency	ID	Quotation	Metaphor	Source	Country
FE	**FE3**	I can **break it down** to what I think is the most fundamental Tony the ability erm to provide leadership during the mission	Ideas are Constructed from Objects	Master List	US
FE	**FE3**	the first three days went extremely **smoothly** erm again principally because the the ICS construct had been introduced and the practiced for the prior fourteen months erm and also because of the recent-cy…. Three and a half month earlier of XXXX XXXX air-crash where many of the same organisations were brought together under the same construct erm things went amazingly **smoothly**	Speed of Action is Speed of Motion	Master List	US
FE	**FE3**	certainly NIMS and ICS are the key… the key pieces erm in in the Command and Control picture	Conducting Research is Solving a Puzzle	Master List	US
FE	**FE3**	also lexicon erm that is somewhat different than our… the people that we support and I think that it's confused and **clouded** the picture	Communication is Showing	Master List	US
FE	**FE3**	one of my prior organisations the coastguard was among some of the earliest organisations to jump on the ICS **bandwagon**	Person and a Horse	Master List	US
FE	**FE3**	so as not to be wedded to a single facility to be able to devolve to another locations	Beliefs are Lovers	Master List	US
FE	**FE3**	we've still got a lot of processes using paper and we're also still **wedded** to what I call typewriter technology	Beliefs are Lovers	Master List	US
FE	**FE3**	so you can see what I **see** as the end state	Communication is Showing	Master List	US
FE	**FE3**	the myopic individual agency perspective without the ability to look **outside** of one's own agency and see how how you **fit** into the greater good	Ideas are Constructed from Objects	Master List	US
FE	**FE2**	if any one of the divisions is engaged in daily operations if I was **down** in involved in what they do with their staff level people I would consider that to be micro-management	Status is Position	Master List	US
FE	**FE2**	my job is to **oversee** that the actions of the agency	Understanding is Seeing	Master List	US
FE	**FE2**	my job is to **oversee** that the actions of the agency are performed by the people who are responsible for the implementation of those actions as we go forward	Progress is Forward Motion	Master List	US

FE	**FE2**	each group **underneath** that has a span of control under it so that it is basically a pyramid effect	Status is Position	Master List	US
FE	**FE2**	in a day to day environment I'm responsible for as I indicated before the five divisions that work **under** my office	Status is Position	Master List	US
FE	**FE2**	it would to a layman on the **outside** you would expect that if your disaster is getting bigger then there would be more resources to erm resources staff erm facilities erm equipment across the whole spectrum that the bigger the disaster the more is required	Knowledge as an External Commodity	Master List	US
FE	**FE2**	in a big event you're not you're not **moving** into recovery until well beyond seventy two hours	Progress is Forward Motion	Master List	US
FE	**FE2**	it's difficult for the Regional Response Coordination Center to **step out** because they're not ready to receive operational control	Progress is Forward Motion	Master List	US
FE	**FE2**	headquarters at Washington would like those to be in fully operational control and independent erm with the RCCC as a support function but in reality it tends the… in overall control coordination of the IMAT until they get fully **up and running**	Physical Movement	Master List	US
FE	**FE2**	when then the IMAT Section Chief or the FCO who's the head of the IMAT team when he says he has operational control then we immediately **step back**	Progress is Forward Motion	Master List	US
FE	**FE2**	Well the FCO has primacy but I think it's kind of a… kind of a dotted line maybe but erm in in the IMAT in the JFO environment the FCO has primacy **over** everyone that's there	Status is Position	Master List	US
FE	**FE2**	Right we will see how that all **unfolds** that is still a relatively… I mean a really new a new piece	Ideas are Constructed from Objects	Master List	US
FE	**FE2**	then he's going to the JFO in Connecticut to get a **flavour** on the ground	Perceiving is Eating	Master List	US
FE	**FE2**	then he's going to the JFO in Connecticut to get a flavour **on the ground**	Status is Position	Master List	US
FE	**FE2**	it was trying to **catch up** in terms of what their responsibilities was who they were answerable to and how it was supposed to go **forward**	Progress is Forward Motion	Master List	US
FE	**FE2**	I have Command and Control of that but I'm **not in the weeds** with that I'm not doing that on a daily basis	Status is Position	Master List	US

FE	**FE2**	I allow the people that work directly for to me to manage what they are responsible for and only where there is an issue that is is beyond what they feel comfortable with does it **rise** to my level	Status is Position	Master List	US
FE	**FE2**	we do something we have an after action that **goes along** with but I don't think we every actually sit back and say… I think in the after action we say you know what did we do well and what could we have done better but I don't that we **step back** and say systematically what worked well systematically and what could we to change the system to do better I don't think we ever do that	Progress is Forward Motion	Master List	US
FE	**FE2**	It's really moved **up** substantially and it's become you know more and more and recognised by everybody else as an essential need	Status is Position	Master List	US
FE	**FE1**	having a structure of operations supported on the **same level** supported by planning logistics and finance and they answer to a qualified Incident Commander	Status is Position	Master List	US
FE	**FE1**	within the within the executive we're given by law delegated **down** from the president to so we have the authority we have the command to ensure that everything is executed within the framework that erm the people of America want	Status is Position	Master List	US
FE	**FE1**	He will in turn delegate certain authorities **down** to the regional administrators	Status is Position	Master List	US
FE	**FE1**	Yes through Craig Fugate that is delegated from the president **down** to… or to the FEMA Administrator I should say	Status is Position	Master List	US
FE	**FE1**	the bigger the disaster that's out of your comfort zone it's not something you've experienced before your natural tendency is to **shape** it into something you're comfortable	Psychological Forces are Physical Forces	Master List	US
FE	**FE1**	because I'm probably gonna erm I go outside the ICS model So it would be a pyramid answering to a **higher** authority	Status is Position	Master List	US
S	**S1**	It's pretty much activated when needed erm we we have erm we will sometimes bring it **up** you know to look at events happening somewhere else	Change is Motion	Master List	US
S	**S1**	Command and Control for us happens at the scene it's happening at the **lowest** level of government	Status is Position	Master List	US
S	**S1**	from my standpoint it's not so much Command and Control as it is erm coordinating assets and making sure that erm that people you know right **down** at the scene have enough to do what they need to do to make things safe	Status is Position	Master List	US

S	**S1**	I was tactical commander on the **ground**	Status is Position	Master List	US
S	**S1**	we knew **ahead** of time	Progress is Forward Motion	Master List	US
S	**S1**	how we are gonna **attack** the problem	Theoretical Debate is Competition	Master List	US
S	**S1**	when our fire departments go to a structure fire example they know they've got to make sure that first people are out of the building and secondly they are gonna **hit** it with everything you know	Obstacles to Action are Obstacles to Motion	Master List	US
S	**S1**	the various components all the way **up** through the federal level	Status is Position	Master List	US
S	**S1**	a big disaster you get an **outpouring** across you know if it's really big you get global resources	Emotions are Entities within a Person	Master List	US
S	**S1**	have you though this through... but we **got there** in the end	Progress is Forward Motion	Master List	US
S	**S2**	I started out in charge of a platoon I worked **up** to be a Company Executive Officer	Status is Position	Master List	US
S	**S2**	unlike the military the different levels of government between federal and state erm unless funding is an issue there's no mandate unless is rooted in statute that the federal government has **over** the next level of emergency management which would be state	Status is Position	Master List	US
S	**S2**	If the there's a Presidential Major Disaster Declaration when that occurs that Stafford Act **kicks** into action the Stafford Act regulates how that assistance is provided to the state once the president has signed it	Physical Movement	Master List	US
S	**S2**	going in to the long term recovery it erm taxes those who are able rise to the occasion	Obstacles to Action are Obstacles to Motion	Master List	US
S	**S2**	I remember speaking with FEMA about the implementation of the FCO and the Federal Disaster Recovery… the FDRC and I'm aware that they're still trying to arrange… **smooth** that over	Speed of Action is Speed of Motion	Master List	US
S	**S2**	we weren't there **back** in the day we can talk about it all we want	Progress is Forward Motion	Master List	US
S	**S2**	We were to back in the day we've all got our own **baggage**	Problem is a Constructed Object	Master List	US
S	**S2**	the National Guard also comes **under** the Governor	Status is Position	Master List	US
S	**S2**	Budgets and allocation rules and statutes all of those things can be thrown **out of the window** at the time of an emergency	Ideas are Constructed from Objects	Master List	US

S	**S2**	typically because erm somebody is not very efficient at managing more than three to seven people your span of control stays within that realm and then you keep on going **down** from there	Status is Position	Master List	US
S	**S2**	with resources in hand erm in line with statutes and regulations that support those resources erm statutes regulators or state government or US government agencies use that money for its intended purpose to in emergency management to save lives mitigate against property and erm recover from incidents and organise themselves for that intended purpose to lessen the effects of disaster response when we have to and recover as quickly as possible and prepare for all of that stuff all of the time and so they five those five mission areas that I mentioned earlier in order to do that prevention protection mitigation response recovery and folded into all those is preparedness so that's the **big picture** as I see it	Conducting Research is Solving a Puzzle	Master List	US
S	**S2**	if any member of the Command and Control element is no longer in a position to exert that control everyone else in that organisation knows what direction they're **heading** and they can in go from there and continue the mission towards that end state	Approaches to a Solution are Paths in Landscape	Master List	US
S	**S2**	what works well is the willingness of different levels of government to help the lower level of government when in need	Status is Position	Master List	US
S	**S2**	that **sprung** out of erm World War Two it came natural in Vietnam it was a little more of a challenge	Ideas are Projectiles	Master List	US
S	**S2**	**up side** of emergency management in this country is that each that each level of government is somewhat independent of the other the **downside** is that each is each level is somewhat independent of the other, there you go	Good is Up	Master List	US
S	**S2**	maximising the decentralisation of capability is the is the goal in that how FEMA is trying to operate but a lot of history and ways of doing business keeps them down the opposite **path**	Approaches to a Solution are Paths in Landscape	Master List	US
S	**S2**	so that tension's always there and we feel it **down** at this level	Status is Position	Master List	US
S	**S3**	you can take it from either direction so we'll take from the **bottom** we live by the philosophy that all disaster are local and the control and management of those disasters is local so we start at the local level in my state every community is required to have an Emergency Management Director cannot be an elected official	Status is Position	Master List	US

S	**S3**	**above** the town level then we have our Counties	Status is Position	Master List	US
S	**S3**	you might have a local EOC or **above** that level you might have county EOC	Status is Position	Master List	US
S	**S3**	every after action report there's always some issues that can be **ironed** out with comms	Easy Action is Easy Motion	Master List	US
S	**S3**	it's slightly **outside the box** thinking we'll see where we go	The Mind is a Container for Objects	Master List	US
E	**E1**	our mission is to respond to large moderate scale events here in the state to supplement the responders already **on the ground**	Status is Position	Master List	US
E	**E1**	I oversee all the Command and Control **on the ground**	Status is Position	Master List	US
E	**E1**	anything to do with medical falls under my falls **under** my auspices	Status is Position	Master List	US
E	**E1**	we've even gone **as far** as erm the Airshow one of our big deployments is erm to ensure all member of leadership have a different coloured t-shirt… just team members are in blue leaders are in grey so they are easily picked out in a crowd	Approaches to a Solution are Paths in Landscape	Master List	US
E	**E1**	so we make sure that there is a **very strong** incident command structure	Strength of Hope is Strength of an Object	Master List	US
E	**E1**	you have one person in charge you have one person delegating orders **down** to these folks you have other ones delegating **down** to there	Status is Position	Master List	US
E	**E1**	if it's a big one you might have a couple of local EOCs **feeding** into a state	Acting on is Feeding	Master List	US
E	**E1**	Communications… yea that's the huge one and an adequate **flow** of communications up and down you know the commander has to be apprised of what's going on	Flow of Events is Flow of Water	Master List	US
E	**E1**	Communications… yea that's the huge one and an adequate flow of communications **up and down** you know the commander has to be apprised of what's going on	Status is Position	Master List	US
E	**E1**	then the feedback has to **flow** down to all levels	Flow of Events is Flow of Water	Master list	US
E	**E1**	then the feedback has to flow **down** to all levels	Status is Position	Master List	US
E	**E1**	you just can't have say the Ops Section getting the information the Ops Section Chief needs to make sure the information gets down to the **boots on the ground**	Status is Position	Master List	US

E	**E1**	you've seen people who've **spun-up** and it makes things worse	Emotions are Forces	Master List	US
E	**E2**	we had a centralised reporting system which allowed us to **push** the communication out to services	Obstacles to Action are Obstacles to Motion	Master List	US
E	**E2**	when there is a state-wide, either a state-wide emergency or some sort of natural disaster would affect the **flow** of the patient	A Problem is a Body of Water	Master List	US
E	**E2**	To show that how their role fits into the **bigger picture**, well I have seen somebody at their worst and I pick them up, don't realise it and I drop them off	Conducting Research is Solving a Puzzle	Master List	US
E	**E3**	the important part is I get to look at it on **two sides** number one I am a field erm emergency manager emergency responder I'm on my town's Fire Department I'm on my I'm on a police Department I'm a Cop in the State I'm also a paramedic	Ideas are Constructed from Objects	Master List	US
E	**E3**	I observe Command and Control on that **rung** when I'm sitting out back at the Operations Desk… the Emergency Operations Center	Status is Position	Master List	US
E	**E3**	federal state county local you know all those types of government that we have we have to take those into consideration and and careful not to **step on feet** because realistically the incidents start local you know as you know in Maine and it's really the whatever town that water's in is their… their problem so we're just gonna support them	Influence is Force	Master List	US
E	**E3**	started with discussion you know moved up to actually erm filling out paperwork to actually erm you know **boots on the ground** doing it	Status is Position	Master List	US
E	**E3**	so let's call a unified command and so… just **building**… based on based on resources based on the need of what is actually needed for that event	Ideas are Constructed from Objects	Master List	US
E	**E3**	I think you've **hit** on a good point	Solving is Striking a Solution	Master List	US
E	**E3**	we don't produce an Incident Action Plan erm we rely on that from the **boots on the ground** we're gonna review that Incident Action Plan and we're going to erm create what's called a situation report	Status is Position	Master List	US
E	**E3**	that's how we operate on a day to day basis I mean I'm a boots on the ground person doing on exercising and training so I'm part of the Operations Division	Status is Position	Master List	US
E	**E3**	it's also to prevent ourselves from getting sued **down the road**	Time is a Landscape we Move Through	Master List	US

E	**E3**	it's difficult to integrate the only way around it is usually to use a nautical term to jury-rig the system by the commander erm rather than the system itself	Obstacles to Action are Obstacles to Motion	Master List	US
E	**E3**	there's some private businesses out there that don't have any erm training in ICS and Command and Control and they function well and they have some pretty significant cyber-attacks or pretty significant issues with money coming in or the stock market falling and they're able to **to go down or to come u**p whenever they need to	Good is Up	Master List	US
E	**E3**	I don't think those are clearly communicated to the **boots on the ground** people	Status is Position	Master List	US
FR	**FR 3**	I've been with the department for twenty two year and I've worked very hard erm starting at the… in the wildfire world starting at the end of a shovel erm and I've worked my way **up** to be a Senior Manager in and a Senior person in our Incident Command System	Status is Position	Master List	US
FR	**FR 3**	we'd be remiss in if we didn't talk also about those support functions that are necessary to erm to make sure that operationally that we're we're moving an incident towards a favourable conclusion	Progress is Forward Motion	Master List	US
FR	**FR 3**	they often fail to think of the fact that there's a lot of other things that are required erm in order to keep the operational side of an incident **moving forward**	Progress is Forward Motion	Master List	US
FR	**FR 3**	it's not just the **boots on the ground** if you will it's the support function	Status is Position	Master List	US
FR	**FR 3**	it was thoroughly disappointing to think that here the the most prolific city in the United states that's had so much happen to it and has so much potential for other things happening to it would be so **backwards** and it just blew my mind	Negative Progress is Backward Movement	Master List	US
FR	**FR 3**	they essentially deferred and delegated there authority to me and my team and we were able to do it and it was the smoothest part of our two weeks	Speed of Action is Speed of Motion	Master List	US
FR	**FR 3**	I personally think that some of the people that they had in charge were **over there head** with respect to qualifications they just you know erm I think they were **over their head**	Inability to Understand is Inability to Grasp	Master List	US
FR	**FR 3**	we rely heavily on as far as documentation on the Incident Action Plan erm the IAP as we call it is critical for us for several reasons number one it is the primary way that we disseminate information **down** to lower level management on the incident that we are working on	Status is Position	Master List	US

FR	**FR 3**	for us it is to safely and efficiently manage incidents both large and small erm in such a way that we are empowering and delegating our authority **down** to the lowest levels	Status is Position	Master List	US
FR	**FR 3**	I want to be able to give broad objectives to the people **below** me I want my mid-level managers to come up with strategy to achieve my objectives that I've set and then at the at the lowest level of management we want to empower those mangers to use tactics to make tactical decisions to achieve both the strategy and the objectives erm for us erm it's about delegating that authority down to the **lowest** levels so that that there's clear intent but there is no there's no question on the chain of command	Status is Position	Master List	US
FR	**FR 3**	what it comes down to you've **hit** on some really great points that credentialing is so critical so that you can pull up and say well I am supposed to be here ad here's how I got here and how I was ordered	Solving is Striking a Solution	Master List	US
FR	**FR 3**	it's not the system that's broken and it's the people on the ground that's often tied	Status is Position	Master List	US
FR	**FR 3**	we have a very good governor here in the state he is involved but he's **hand's off** to an appropriate level eh the governor before him was a little more **hand's on** but more involved probably more dialled in but also **hands off**	Mental Control is Physical Control	Master List	US
FR	**FR 1**	it will always defer **down** to the next senior person	Status is Position	Master List	US
FR	**FR 1**	Command and Control is understanding erm number understanding your role and the entire picture	Conducting Research is Solving a Puzzle	Master List	US
FR	**FR 1**	Command and Control not only has to be just one person you got to make sure you've got that line of succession so that there's always somebody people can look **up** to for direction	Status is Position	Master List	US
FR	**FR 1**	you've got to form these alliances **ahead** of time so you know that… that's another thing you network **ahead** of time get to know these folks **ahead** of time then that trust factor's there	Time is a Landscape we Move Through	Master List	US

FR	**FR 1**	the scenario central command is nowhere all of a sudden these units were coming in with lieutenant grade officers captain grade officers and working with the local and they floundered because without any direction they didn't know how to to come up with strategies on their own they always were you know… reliant upon guidance from up **above** and erm boy didn't that come out during	Status is Position	Master List	US
FR	**FR 1**	you have to empower your people to **step-up** and assume that role	Status is Position	Master List	US
FR	**FR 1**	it took us time to get a **grasp** of the situation	Ideas are Objects	Master List	US
FR	**FR 1**	You look at video after the Boston marathon bombing you know and you look at video and what you see is people walking around in a daze with their face **buried** into their smart phones looking for the information	Impediments to Awareness are Impediments to Seeing	Master List	US
FR	**FR 1**	we always asked him we said hey listen what was what was your plan anyway… what… and my plan was put the fire out and so he says well what happened it didn't go out (laughing) you know… off course it didn't go out you know cos you didn't have a plan you were basically **chasing** the incident instead of getting **ahead** of it	Progress is Forward Motion	Master List	US
FR	**FR 1**	No continuity at the **top** at all	Status is Position	Master List	US
FR	**FR 1**	we know who's on scene we know why they are and… and we know what they are doing and so in the fire service that's very important and it's requires good coordination at the **top**	Status is Position	Master List	US
FR	**FR 1**	you might turn around and say well we've got take care of the environment first and so you put people in **harm's wa**y to to… and not realising it then people get hurt or killed	Harm is Preventing Motion	Master List	US
FR	**FR 1**	there's always at the **top** a command element	Status is Position	Master List	US
FR	**FR 1**	then you go **down** to the different modules	Status is Position	Master List	US
FR	**FR 1**	when you have that error of infallibility it's not gonna happened here then it happens then you're playing **catch up**	Progress is Forward Motion	Master List	US
FR	**FR 1**	**Looking down the road**, don't get tunnel vision you wanna look ahead	Progress is Forward Motion	Master List	US
FR	**FR 2**	we worked with plans that we had established **ahead** of time	Progress is Forward Motion	Master List	US

FR	**FR 2**	they had a significant incident that required a bunch of agencies while we were we there were ten or twelve other emergencies going on so and it went very **smoothly**	Easy Action is Easy Motion	Master List	US
FR	**FR 2**	Fire Departments are struggling our state is just **pushing** for legislation to give them (volunteers) benefits retirement benefits if they serve longer	Control Over Action is Control Over Motion	Master List	US
FR	**FR 2**	as far a firefighter safety is concerned erm there's been a national **push** for Command and Control and educating officers about how important it is to use it	Control Over Action is Control Over Motion	Master List	US
FR	**FR 2**	our firefighters embrace it they understand it they're eager to use it younger firefighters are eager to get **up** into that role cos they… there's definitely the leadership component to it	Status is Position	Master List	US
FR	**FR 2**	you'd have an Operations Chief for a division then **under** that you might Fire Departments Police Departments Public Works depending on the incident	Status is Position	Master List	US
FR	**FR 2**	the federal level their IMAT system their their Regional Response Coordination Coordination Centers all the way **up**	Status is Position	Master List	US
FR	**FR 2**	by having the policies in place and the training and going out and effectively using it every day erm it's predictable that when the bigger events happen things are gonna run much more **smoothly**	Easy Action is Easy Motion	Master List	US
FR	**FR 2**	that has really **opened my eyes**… it's really shocked me	Understanding is Seeing	Master List	US
LE	**LE1**	from the outset erm our department felt we would better served to go in and and kind of stand them **up** take some of the burden off them	Good is Up	Master List	US
LE	**LE1**	Command and Control **in my mind** is basically making order out of chaos	The Mind is a Container for Objects	Master List	US
LE	**LE1**	kind of running it **in their head** maybe with you know with a few notes on a piece of paper erm and just dealing with the issues that come up	The Mind is a Container for Objects	Master List	US
LE	**LE1**	people come in from the entry level and they progress **up** through	Status is Position	Master List	US
LE	**LE1**	instead of things kind of **flowing the way they're gonna flow** and we'll deal with this brush fire when it comes up over here until the next ones comes up and we'll jump onto that one	Flow of Events is Flow of Water	Master List	US
LE	**LE1**	it gives a system for coordinating everything and kind of pulling it together	Results are Net Balances	Master List	US
LE	**LE1**	your Unified Command your specialist responders **underneath** you'll have your Area Commanders you'll have your local EOC fully manned	Status is Position	Master List	US

LE	**LE1**	one two or three days into a case like that is you start getting **flooded** with requests	Flow of Events is Flow of Water	Master List	US
LE	**LE1**	in those kinds of instances people are just **chomping at the bit** to help	Person and a Horse	Master List	US
LE	**LE3**	as far as Command and Control… ICS you know the Incident command System in the rockaways **flowed** fairly well	Flow of Events is Flow of Water	Master List	US
LE	**LE3**	it's just how the hierarchy work the Sergeant the Sergeant takes over Lieutenant all the way **up** through	Status is Position	Master list	US
LE	**LE3**	you know information sharing I think has come… it's not where it really should be but I think we've **come a long way**	Progress is Forward Motion	Master List	US
LE	**LE3**	by the time it gets **down** to the local level there is so much area for… or scope for misinterpretation or interpretation depending on your view that we have over one county to the next slightly different approaches to something that should just be very simple	Status is Position	Master List	US
LE	**LE3**	he was way over his head and he didn't know it and he was too proud not too admit it so that was a problem	Control is Up	Master List	US
LE	**LE3**	SAFECOM continuum basically establishes how communications are based and then you know just because you have a radio doesn't mean you're at the highest level of interoperability and you have your different lanes on the continuum	Good is Up	Master List	US
LE	**LE3**	it's sad in this day and age after Katrina and 9/11 I mean in all these incidents and… it's almost almost like they're **going back** to where it was before and I just cringe because we're better than that	Progress is Forward Motion	Master List	US
LE	**LE3**	when you've got the Mayor who does carry a **lot of weight**	Amount is Weight	Master List	US
LE	**LE3**	I think hit some of the **high** points a couple of the **low** points	Good is Up	Master List	US
LE	**LE2**	RAES falls **under** the federal government they can work for agencies like MEMA and the county agencies	Status is Position	Master List	US
LE	**LE2**	you know being able to **see** both the law enforcement side of things the fire side of things the search and rescue side of things	Understanding is Seeing	Master List	US
LE	**LE2**	the rescue's done now it's recovery so these are the **layers** of recovery	Ideas are Constructed from Objects	Master List	US

LE	**LE2**	all I care about is when the Incident Commander is who the heck is in charge of that you know he's got the list of **underneath** him of all the people so I say to him get this done and he goes okay and he tells these people this is what they need to do	Status is Position	Master List	US

7.9 Appendix 8: Steen's Metaphor Identification Process (MIP)

The MIP is as follows:

1. Read the entire text–discourse to establish a general understanding of the meaning.

2. Determine the lexical units in the text–discourse

3. (a) For each lexical unit in the text, establish its meaning in context, that is, how it applies to an entity, relation, or attribute in the situation evoked by the text (contextual meaning). Take into account what comes before and after the lexical unit.

(b) For each lexical unit, determine if it has a more basic contemporary meaning in other contexts than the one in the given context. For our purposes, basic meanings tend to be more concrete; what they evoke is easier to imagine, see, hear, feel, smell, and taste. Related to bodily action, more precise (as opposed to vague): historically older. Basic meanings are not necessarily the most frequent meanings of the lexical unit.

(c) If the lexical unit has a more basic current, contemporary meaning in other contexts than the given context, decide whether the contextual meaning contrasts with the basic meaning but can be understood in comparison with it.

4. If yes, mark the lexical unit as metaphorical.

Source: (Steen et al. 2010) (p 3)